

DEER HABITAT EVALUATION

WINEMA N.F.

PREPARED BY: BILL PIERATT

MARCH , 1984



Art,
Here's to the future.
I hope this turns out to
be as useful as we expect
it to be.
Thanks for the opportunity.
Bill

PACKAGE CONTENTS

1. LETTER OF POLICY AND DIRECTION
2. DEER HABITAT EVALUATION PROCESS DOCUMENT
3. COMPUTER PROGRAM USER DOCUMENTATION
4. SITUATION ASSESSMENT DOCUMENT



United States
Department of
Agriculture

Forest
Service

Winema National Forest
P.O. Box 1390
Klamath Falls, OR 97601

Reply To: 2620 Planning
2630 Habitat

Date: March 16, 1984

Subject: Deer Habitat Evaluation Model

To: District Rangers, D-1, D-2

As a result of the closeout meeting we held on March 14, 1984, concerning the habitat evaluation process, I have decided to adopt the following approach on the Winema N. F. for deer habitat planning:

1. We will continue to follow current management direction for deer habitat.
2. We will immediately adopt the Model and process as policy for evaluating projects.
3. The information gathered in preparing a draft EA will be transferred to the LMP process and where applicable to the RPA updating process.
4. The Technical Action Committee will continue to test and evaluate the Model and will, as a result of this testing, advise management about recommended changes in the Model. They will also provide input to the LMP process concerning the way the Model is used in generating data and evaluating impacts of FORPLAN alternatives.

Attached is a final copy of the document describing the deer habitat evaluation process and model.

Also for your use is the following list of direction and constraints which is a combination of current N. F. direction and that provided in the Blue Mountain Habitat Guides edited by Jack Ward Thomas.

1. Desired cover-forage ratio will be 40-60 on summer range.
2. Desired cover-forage ratio will be 50-50 on winter range.
3. The cover component of winter range will be divided equally between hiding cover and thermal cover.
4. Fawning habitat should be maintained or enhanced within 600 feet of water sources.
5. Disturbing human activities in deer fawning habitat will not be permitted from May 15 through July 15.
6. Major movement patterns and migration routes of big game should be considered in planning and implementing project activities.





7. Disturbing human activities in deer winter range will not be permitted from November 15 through March 15.
8. Blocks of untreated area which are of logical future management size will be left between regeneration units so that proper diversity can be maintained and provided in the future.

The following are ways in which the Deer Habitat Evaluation Model can be used in project assessment on Ranger Districts.

1. The current habitat situation can be described in terms of cover- forage ratio, habitat suitability index, or capability of supporting deer(deer/sq. mi.).
2. The relationship between the Tribal and ODFW population objective and the current or projected conditions can be shown. For example we could show that a projected future condition would support 11.5 deer per square mile and the population objective for the area under study is 9.0 deer per square mile.
3. A comparison among alternatives in terms of the effect on an area's capability to support deer can be made. For example, one alternative may show a capability of supporting 6.5 deer per square mile, while another alternative may show a 12.0 deer per square mile capability. A third alternative may show a capability of 12.5 deer per square mile. The decision maker can use this information in choosing a course of action.
4. Obviously any alternative can be compared to the current situation and the change which would result in capability to support deer could be described.
5. Projections for future conditions can be made by creating data files which simulate stages of development over time which are set in motion by specific treatments or a series of treatments.

These uses of the evaluation model should be apparent in the following places in an Environmental Assessment:

1. Affected Environment
2. Biological Evaluation in the Appendix
3. Effects of Implementation of the Alternatives

ARTHUR W. DUFAULT
Forest Supervisor



DEER HABITAT EVALUATION PROCESS

BASIN AND RANGE PHYSIOGRAPHICAL PROVINCE

WINEMA NATIONAL FOREST

BY

WILLIAM J. PIERATT

HABITAT PROJECT MANAGER

FEBRUARY 15, 1984

Credit: Significant portions of this document are borrowed with permission from the work of Karen Shimamoto and Mike Ross of the Modoc NF, Alturas, California.

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DEER HABITAT EVALUATION PROCESS

WINEMA NATIONAL FOREST

The decision by the Winema NF to apply a habitat evaluation process to mule deer habitat was determined by the need to resolve resource management alternatives for Land and Resource Management Planning, project planning, policy formulation, and for cooperative management of deer habitat which is required in the Consent Decree.

Based on initial work by Hal Salwasser, R-5 Regional Wildlife Biologist, discussions with Forest Service wildlife biologists, ODFW biologists, and the Klamath Tribal biologist, and on practical implementation of such a process on the Modoc National Forest, it was determined that an application of the process on the Winema NF was feasible.

For the initial application, the deer habitat variables chosen by the Modoc NF were selected for use on this project. Consideration was also given as to whether or not information on a variable was available in the Forest's data base.

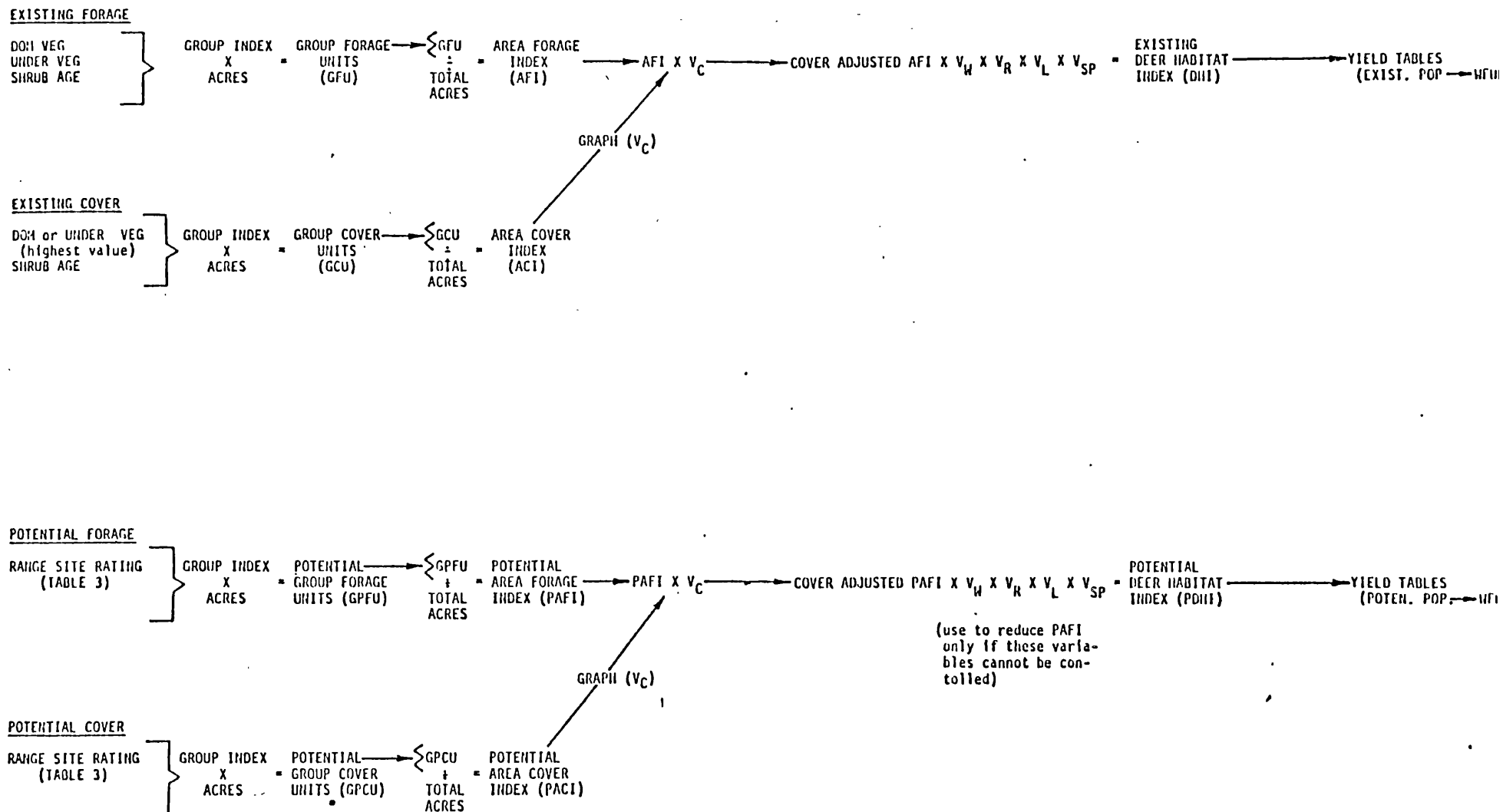
The variables Dominant Vegetation, Understory Vegetation, Shrub Age Class, and Plant Community were identified as the primary determinants of deer habitat quality and quantity. These variables would serve as the basic measurement of forage and cover in the analysis. All other variables, such as water, roads, livestock forage utilization, etc., modify forage and cover values either negatively or positively.

The influence of selected habitat variables on deer was tabularly modeled. Models for Dominant Vegetation, Understory Vegetation, and Plant Community were further refined to fit the detailed information in the Forest data base. Each distinct vegetation type or plant community was rated according to its capability and suitability to produce cover or forage for deer. Ratings were based on a scale of 1.0 to 0 (1.0 equalling the highest value and 0 equalling no value) and used to calculate an overall habitat index within this range of values.

Habitat indices were calculated for small sample areas as a test of the variables, which were then finalized based on this testing.

This system resulted in the Habitat Evaluation Process described on the following pages. The current process is subject to additional testing and minor revision, but it approximates the final process which will be used in project analysis and LRMP. The entire process is illustrated in Figure 1.

FIGURE 1. WINEMA N.F. DEER HABITAT EVALUATION PROCESS



HABITAT EVALUATION PROCESS

The following section describes the process used in evaluation of deer habitat on the Winema National Forest.

1. The first step in the process is to define and delineate the area on which the evaluation will be performed. This area can be of any size: entire seasonal ranges, "key" areas within seasonal ranges, or project areas such timber sales, range allotments, etc.
2. For each capability area (polygon), determine the following habitat variable from the Appendices.

<u>Variable</u>	<u>Corresponding Rating</u>
Dominant Vegetation	V - Forage Rating DF V - Cover Rating DC
Understory Vegetation	V - Forage Rating UF V - Cover Rating UC
Plant Community	V - Potential Forage Rating PF V - Potential Cover Rating PC

For the evaluation area, determine ratings for the following habitat variables from the appropriate tables in the Appendices.

<u>Variable</u>	<u>Corresponding Rating</u>
Shrub Age	V - Forage Rating SF V - Cover Rating SC

Shrub Age for the evaluation area is calculated using a weighted average. This is necessary since shrub age is not identified in the data base, but must be determined by the field biologist or range conservationist through on-the-ground knowledge. Example:

Forage Rating (from Model)	% Composition in			Area Rating
		<u>Evaluation</u>	<u>Area</u>	
Seedling - .8	x	.10	=	.08
Young - 1.0	x	.15	=	.15
Mature - .8	x	.50	=	.40
Decadent - .4	x	.25	=	.10

Area Rating: .73

Cover Rating for shrubs is calculated by the same process.

3. With the ratings determined above, calculate the following:

$$\text{Group Forage Units} = \left(V_{DF} \times V_{UF} \times V_{SF} \right)^{1/3} \times \text{Acres}$$

$$\text{Group Cover Units} = V_{DC} \text{ or } \left(V_{UC} \times V_{SC} \right)^{1/2} \times \text{Acres}$$

$$\text{Group Potential Forage Units} = V_{PF} \times \text{Acres}$$

$$\text{Group Potential Cover Units} = V_{PC} \times \text{Acres}$$

To calculate Group Cover Units, the higher rated vegetation occurring on the site is used. If both DOM-VEG and UNDER-VEG are used, the rating is lowered if the two variables are not equal.

Groups are defined as capability areas (polygons) with the same dominant vegetation, understory vegetation, and plant community. For example, all capability areas with a dominant vegetation label of P3P (poorly stocked, Ponderosa pine, Size Class 3), an understory vegetation label of ST (bitterbrush), and a plant community label of 25 (PP, Putr, Fescue) are grouped for evaluation. Group acres are the sum of all acres for all capability areas in the P3P/ST/25 group.

Potential forage or cover groups are all capability areas with the same plant community, i.e., the same potential forage or cover rating.

4. Calculate area indices in the following manner:

$$\text{Area Forage Index (AFI)} = \text{GFU} / \text{Total Area Acres}$$

$$\text{Area Cover Index (ACI)} = \text{GCU} / \text{Total Area Acres}$$

$$\text{Potential Area Forage Index (PAFI)} = \text{GPFU} / \text{Total Area Acres}$$

$$\text{Potential Area Cover Index (PACI)} = \text{GPCU} / \text{Total Area Acres}$$

5. Since the assumption has been made that forage values form the basis for measuring deer habitat, all other variables, including cover, modify the forage value in some manner. In this step, the Area Forage Index (AFI) and the Potential Forage Index (PAFI) are modified by the Area Cover Index (ACI) or Potential Area Cover Index (PACI), and a cover-adjusted AFI and PAFI are derived.

$$\text{Cover-Adjusted AFI} = \text{AFI} \times \frac{V}{C}$$

$$\text{Cover-Adjusted PAFI} = \text{PAFI} \times \frac{V}{C}$$

6. Determine the ratings for area habitat variables from the tables in the Appendix.

<u>Variable</u>	<u>Corresponding Rating</u>
Water	V - Forage Index Modifier W
Roads	V - Forage Index Modifier R
Livestock	V - Forage Index Modifier L

The area rating for livestock can be calculated using the same weighted average method used for calculating shrub age ratings.

7. Calculate the existing and potential Deer Habitat Index using the variables identified in Step 5.

$$\text{Deer Habitat Index (DHI)} = \text{Cover-Adjusted AFI} \times \frac{V}{W} \times \frac{xV}{R} \times \frac{xV}{L}$$

$$\text{Potential Deer Habitat Index (PDHI)} = \text{Cover-Adjusted PAFI} \times \frac{V}{W} \times \frac{xV}{R} \times \frac{xV}{L}$$

The variables should only be used to adjust the PDHI if they cannot be controlled or corrected through mitigation or management, e.g., roads which cannot be closed.

The use of area variables to reduce the forage index should be used with caution. Determinations should be made of the extent to which these area variables actually influence deer habitat. Since these variables are direct percentage reductions in the AFI, they can significantly lower the AFI beyond on-the-ground conditions.

8. The Existing Deer Habitat Index and Potential Deer Habitat Index will be used to predict deer populations. This prediction can be made by referring to the graph in the Appendix.

Computer Application

Habitat evaluation, using the process outlined in the previous section without computer assistance, requires considerable time when applied to large areas or when habitat indices are projected over numerous decades. We have adopted an interactive BASIC program to run all calculations. For further information on this program contact Bill Pieratt or Jack Inman.

This process will not identify those aspects of deer management that deal with deer sociology, animal condition, and the effects of weather or predation on population levels.

The model measures deer habitat capability and should be primarily used to evaluate habitat conditions. A secondary use can be to predict population responses to changes in habitat.

APPENDIX A

PROCESS CRITERIA

GENERAL ASSUMPTIONS

SPECIFIC ASSUMPTIONS

CRITERIA FOR PROCESS DEVELOPMENT

Any process developed must be:

1. compatible with the Forest's data base. The data base from which the data files for this program were compiled include TRI, in-place stand mapping, and Plant Community Maps. The habitat evaluation process was designed to use variables based on current data stored in these sources.
2. capable of being calculated with computer software programs.
3. an accurate reflection of environmental changes (sensitivity, accuracy, etc.)
4. acceptable to line officers, ID Team members, and specialists as a reflection of environmental consequences.

Any process developed should be:

1. accessible to field personnel on Ranger Districts for use in project evaluation.
2. applicable to both Land Management Planning and project level work.

GENERAL ASSUMPTIONS

1. Vegetation quantity and quality are the primary determinants of deer habitat quantity and quality.
2. Vegetation types have certain inherent values for deer, and these values can be qualitatively rated.
3. Plant community can be used as a measure of productivity and can be used to predict the vegetation with the highest cover or forage value that a given site will produce.
4. Deer respond positively or negatively to direct changes in vegetation.
5. Deer response to changes in vegetation can be predicted based on field observations, literature, and historic trends.
6. Although a given vegetation type has an inherent value for deer, limiting factors such as roads, water livestock grazing, and spatial arrangement of cover and forage can reduce the value to deer. Conversely, correction of these factors (e.g., providing water, closing roads) will enable a given vegetation type to meet its inherent value.
7. Factors such as climate or mortality cannot be modeled or assessed in this habitat evaluation process.

SPECIFIC ASSUMPTIONS

Dominant and Understory Vegetation

1. Open-canopied timber stands have higher forage values than closed-canopy stands. Conversely, closed-canopy stands provide more cover (hiding and thermal) than open-canopied stands.
2. Plantations will have low values to deer for both cover and forage in their early stages. This is due to the severity of site preparation planned for most stand regeneration activities.
3. Cover values in plantations will increase after the first decade. Forage will increase after 3 years but will be eventually moderated by canopy closure.

Potential Vegetation - Plant Community

4. Based on Plant Community Guides for the area under consideration, the best vegetation for cover or forage that a site can produce can be predicted. This highest value vegetation can occur through direct manipulation or natural succession.

Forage versus Cover

5. Forage is the primary determinant of the capability of an area as deer habitat. Adequate cover retains the habitat value, while inadequate cover reduces the habitat value.

Shrub Age Class

6. Shrub age is a function of vegetation (for forage and cover) and as such, does not modify these values. It is analogous to stand size and canopy closure of trees, which is directly tied to the assigned ratings of dominant vegetation.
7. Although not identified during vegetation mapping, shrub age classes can be reasonably assigned by the field biologist or range conservationist. This information can also be obtained during stand exams.

Area Variables

8. Area variables (distance between water, road density, and livestock grazing) have a direct influence on deer habitat quality. The extent to which these variables influence habitat capability can be assessed through literature review and on-the-ground knowledge.

APPENDIX B

Deer Habitat Tables - All Variables

SHRUB AGE RATINGS FOR FORAGE AND (COVER)

<u>SHRUB</u>	<u>AGE-CLASS</u>			
	<u>SEEDLING</u>	<u>YOUNG</u>	<u>MATURE</u>	<u>DECADENT</u>
Bearberry	.1(0)	0(0)	0(0)	0(0)
Green Rabbitbrush	.3(0)	.6(.1)	1.0(.4)	.3(.3)
Bitterbrush	.1(0)	.4(.2)	1.0(.6)	.4(.5)
Ceanothus	.7(.1)	1.0(.4)	.5(.8)	.3(1.0)
Mahogany	.1(0)	1.0(.3)	.8(1.0)	.3(.9)
Big Sagebrush	.3(.1)	1.0(.2)	.6(.6)	.4(.5)
Manzanita	.5(.1)	1.0(.3)	.3(.7)	.1(1.0)
Currant	.7(.1)	1.0(.2)	.6(.4)	.2(.3)
Blueberry, Huckleberry	.5(0)	1.0(.1)	.5(.2)	.3(.2)
Snowberry (creeping)	1.0(0)	.7(0)	.5(0)	.1(0)
Serviceberry	.5(0)	1.0(.1)	.7(.2)	.1(.2)
Low sagebrush	.1(0)	1.0(0)	.8(.1)	.2(.1)

Rated by: Craig Bienz, Jack Inman, Ralph Opp, Gene Silovsky

These ratings are intended for general situations. If a specific area being evaluated is significantly different, values which reflect that specific set of conditions should be used.

AFI/PAFI MODIFIERS FOR DISTANCE BETWEEN WATER SOURCES

<u>GENERAL</u>	
<u>Distance(mi.)</u>	<u>Modifier</u>
0	1.0
1	1.0
2	1.0
3	1.0
4	.7
5	.4
6	.2

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Ralph Opp

AFI MODIFIER FOR COVER:FORAGE RATIO

<u>SUMMER RANGE</u>		<u>WINTER RANGE</u>	
<u>C:F</u>	<u>Modifier</u>	<u>C:F</u>	<u>Modifier</u>
10/90	.2	10/90	.1
20/80	.4	20/80	.3
30/70	.9	30/70	.7
40/60	1.0	40/60	1.0
50/50	1.0	50/50	1.0
60/40	.9	60/40	1.0
70/30	.7	70/30	.9
80/20	.6	80/20	.8
90/10	.5	90/10	.7
		100/0	.6

Rated by: Ralph Opp, Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

The C:F Ratio modifier is an adjustment for quality. C:F ratios outside the optimum range will result in a discounting due to quality which is less than optimum.

AFI MODIFIER FOR LEVEL OF LIVESTOCK GRAZING USE

Percentages are percent of total production available for all grazing use after fifty percent of the current year's production has been allocated for plant reserves.

<u>Summer Range And</u>		<u>Heavy Use</u>	
<u>Light Use Winter Range (by deer)</u>		<u>Winter Range (by deer)</u>	
<u>% Livestock Use</u>	<u>Modifier</u>	<u>% Livestock Use</u>	<u>Modifier</u>
0	.9	0	1.0
10	1.0	10	.9
20	1.0	20	.8
30	.9	30	.7
40	.8	40	.6
50	.6	50	.5
60	.5	60	.4
70	.4	70	.3
80	.3	80	.2
90	.2	90	.1
100	0	100	0

Rated by: Ralph Opp, Craig Bienz, Jack Inman, Gene Silovsky, Bill Pieratt

*That portion of annual production allocated for plant reserves (50%) is actually available to deer. If this forage is taken by deer, a long term decrease in carrying capacity will result due to decreasing health and vigor of plants.

AFI/PAFI MODIFIER FOR ROAD DENSITY			
<u>SUMMER RANGE</u>		<u>WINTER RANGE</u>	
<u>Roads</u>	<u>(mi/sec.)</u>	<u>Modifier</u>	
0		1.0	
1		.9	
2		.9	
3		.8	
4		.6	
5		.5	
6		.3	

Rated by: Gene Silovsky, Ralph Opp, Craig Bienz, Jack Inman

AFI/PAFI MODIFIER FOR AREA COVER INDEX (ACI)

<u>Area Cover Index</u>	<u>Modifier</u>
0	.4
.1	.6
.2	.8
.3	.9
.4	1.0
.5	1.0
.6	1.0
.7	1.0
.8	1.0
.9	1.0
1.0	1.0

Rated by: Jack Inman, Bill Pieratt

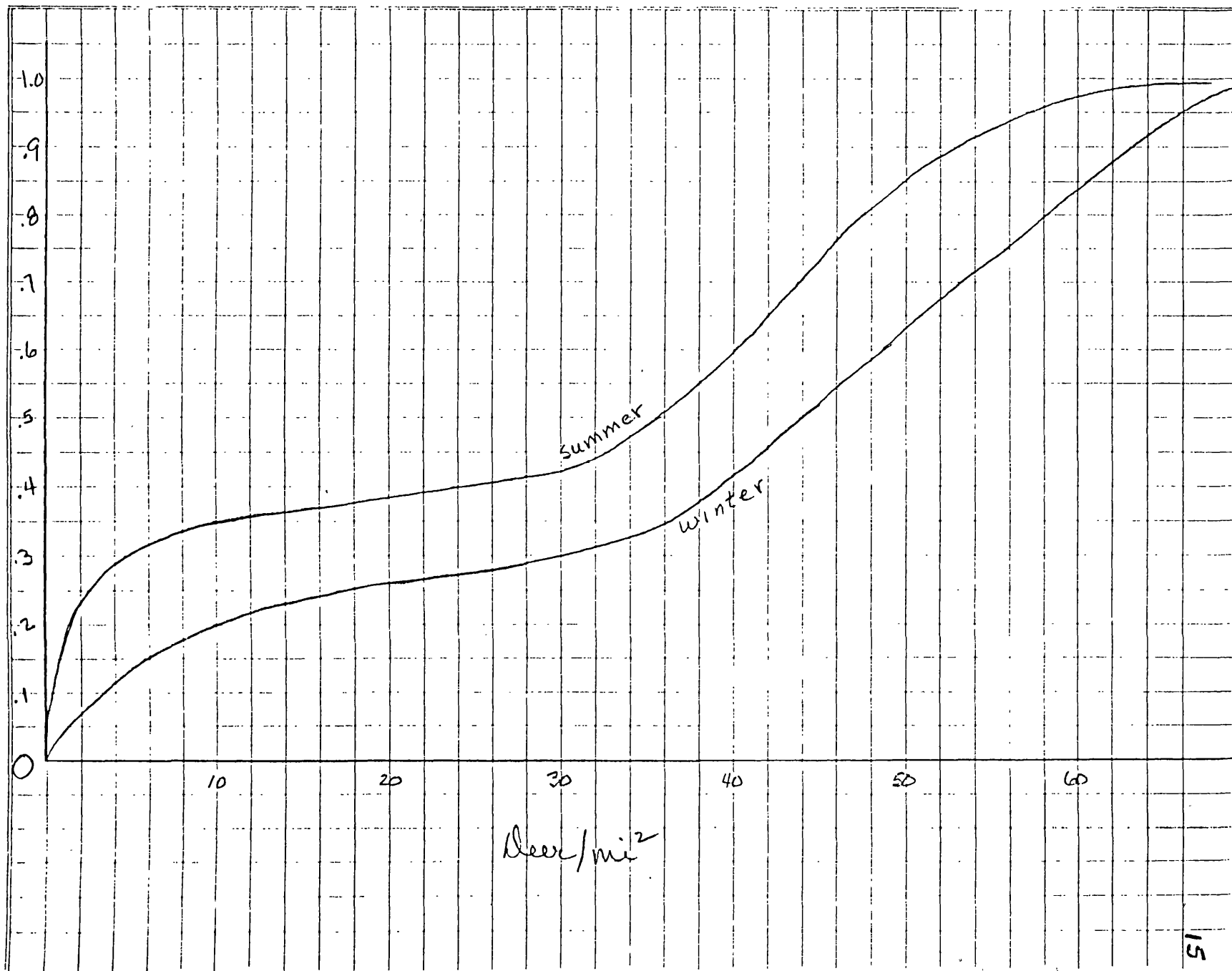
The ACI modifier for AFI/PAFI is an adjustment for quantity. As long as the minimum of .4 (ACI) is present, there is no AFI discount for quantity.

APPENDIX C

Vegetation Type Ratings - Cover, Forage

Potential Ratings - Cover, Forage

HSI.



DOMINANT VEGETATION AND UNDERSTORY VEGETATION RATING FOR FORAGE

<u>Rating</u>	<u>Code</u>	<u>Vegetation</u>
1.0	SX	Mountain Mahogany
	HA	Aspen
	ST	Bitterbrush
	WM	Moist Meadow
	GH	Annual grasses and forbs
	GF	Perennial Forbs
	CV	Ceanothus
	CVF	Ceanothus Brushfield
	LX1	LPP, young, wet, 10-40 years
	LX3	LPP, old, wet, 40+ years
.9	GL	Dry Meadows, bunchgrass, seedings
.8	KXP	Juniper 10-40 TPA
.7	P4P	PP large sawtimber, HRG, less than 39% cr. cl.
.6	P3P	PP small sawtimber, HRG, less than 39% cr. cl.
	KXM	Juniper, 40-70 TPA
	SV	Serviceberry
	LX4	LPP, young, dry, 10-40 years old
	PAC	Plantations 4.5' tall to 15 years old
.5	SB	Big sage, Big sage-grass
	M2X	All conifer stands w/ HTH silv. models
.4	KXG	Juniper, 70+ TPA
	M1X	All conifer stands w/ SPC silv. models
	M3P	Pine-assoc. small sawtimber, HRG, less than 40% cr. cl.
	M4P	Pine-assoc. large sawtimber, HRG, less than 40% cr. cl.
	SN	Snowberry
	HB	Huckleberry-blueberry
	CT	Currant
	SR	Green Rabbitbrush
	LX2	LPP, old, dry, 40+ years old
.3	MZ	Manzanita
	MZF	Manzanita Brushfield
	SL	Low sagebrush
	P3M	PP sawtimber, HRG, 40-60% cr.cl.
	W3P	White-fir small sawtimber, HRG, less than 39% cr. cl.
	W4P	White-fir large sawtimber, HRG, less than 39% cr.cl.
	PLP	Plantations with saplings 1.5-4.5' tall
	P3G	PP sawtimber, HRG, 40% cr. cl.
.2	WW	Wet Meadows
	M3G	Pine-assoc. small sawtimber, HRG, 40%+ cr. cl.
	M4G	Pine-assoc. large sawtimber, HRG, 40%+ cr.cl.
	P6G	PP two-storied, HFR
	UX	Plantations with seedling less than 1.5' tall*
.1	BB	Bearberry
	W3G	WF small sawtimber, HRG, 40%+ cr. cl.
	W4G	WF large sawtimber, HRG, 40%+ cr. cl.
	M6G	Pine-assoc., two-storied, HFR
	W6G	WF two-storied, HFR
	RY	Gray Rabbitbrush
0	NB	Barren-rocks
	NW	Water

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

* To be used for first-year plantations

DOMINANT VEGETATION & UNDERSTORY VEGETATION RATINGS FOR COVER

1.0	KXG	Juniper, 70+ TPA
	M6G	Pine-assoc. stands-two storied-HFR
	W6G	White-fir stands, two-storied, HFR
	P6G	PP two-storied, HFR
	W3G	Pine-assoc., small sawtimber 70% cr. cl. HRG
	P3G	PP sawtimber 70% cr. cl. HRG
	SX	Mountain Mahogany
	PAC	Plantations 4.5' tall to 15 years of age
.9	LX1	LPP, young, wet, 10-40 years old
	LX4	LPP, young, dry, 10-40 years old
.8	CVF	Ceanothus brushfield
	LX3	LPP, old, wet, 40+ years
.7	MZF	Manzanita brushfield
.6	CV	Ceanothus
	LX2	LPP, old, dry, 40+ years
	M1X	All conifer stands w/ SPC silv. models
	M2X	All conifer stands w/ HTH silv. models
	W3P	WF small sawtimber 40-70% cr. cl., HRG
	W4P	WF large sawtimber 40-70% cr. cl., HRG
.5	HA	Aspen
	M4G	Pine-assoc. large sawtimber 40% cr. cl. HRG
	M3G	Pine-assoc. small sawtimber 40% cr. cl. HRG
	W4G	WF large sawtimber, 40%+ cr.cl. HRG
	KXM	Juniper, 40-70 TPA
	M4P	Pine-assoc. large sawtimber, 40-70% cr. cl.
	M3P	Pine-assoc. small sawtimber, 40-70% cr. cl. HRG
	P4P	PP small sawtimber less than 40% cr. cl. HRG
.4	P3M	PP small sawtimber 40-70% cr. cl. HRG
	MZ	Manzanita
	ST	Bitterbrush
.3	KXP	Juniper 10-40 TPA
	SB	Big sagebrush
	PLP	Plantations w/ seedlings 1.5-4.5' tall
.2	WM	Moist meadows
	WW	Wet meadows
	SR	Green Rabbitbrush
	RY	Gray Rabbitbrush
.1	UX	Plantations w/ seedlings less than 1.5' tall
	SL	Low sagebrush
	CT	Currant
	GL	Dry meadows, bunchgrass, seedings
	GH	Weeds and annual grasses
	GF	Perennial forbs
	BB	Bearberry
	SN	Snowberry
	HB	Huckleberry, blueberry
0	NB	Barren-rocks
	NW	Water

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

PLANT COMMUNITY PRODUCTIVITY POTENTIAL COVER RATING

Basis: Highest rated (cover) dominant or understory vegetation type predicted for each community.

1.0	02	CW-H1-11	Mx-con, snowbrush, chinkapin
	03	CR-S1-11	Mx-con, manzanita
	04	CW-S1-12	Mx-con, snowbrush, manzanita
	05	CW=S1-15	Mx-con, snowbrush, sedge
	06	CW-S1-14	Mx-con, snowbrush
	07	CP-S3-12	PP, Putr, snowbrush, sedge
	08	CL-F1-11	LPP, forb
	09	CW-S1-16	Mx-con, snowbrush, sq. carpet, strawberry
	10	CW-S3-12	WF, snowberry, strawberry
	64	CW=C3-11	WF, LPP, long stolon sedge, needlegrass
	65	CW-S3-13	WF, PP, snowberry, starwort
	66	CW-S1-17	WF, PP, manzanita, Ore. grape
	67	CW-C4-12	WF, PP, Sug P, manzanita
	68	CW-C1-11	WF, PP, IC, serviceberry
	69	CW-C4-11	WF, PP, WWP, sticky currant
	70	CW-H2-11	WF, PP, Aspen, long stolon sedge
	11	CL-M2-11	LPP, bearberry
	12	CL-M3-11	LPP, blueberry wetland
	13	CL-M1-11	LPP, sedge, grass wetland
	14	CL-S9-11	LPP, snowbrush, manzanita
	15	CL-S2-14	LPP, bitterbrush, fescue
	17	CL-S2-12	LPP, bitterbrush, sedge
	18	CL-S2-11	LPP, bitterbrush, needlegrass
	19	CL-S2-15	LPP, currant, Putr, needlegrass
	20	CL-G4-11	LPP, sedge, lupine
	21	CL-G3-14	LPP, needlegrass, lupine
	22	CL-G3-13	LPP, needlegrass, lupine, linanthostrum
	24	CL-S4-12	LPP, grouse huckleberry
	56	CL-C1-12	LPP, Wh Bk P, WWP, sandwort
	57	CL-G3-15	LPP, strawberry, fescue
	59	CL-H1-11	LPP, Aspen, strawberry
	25	CP-S2-11	PP, Putr, fescue
	26	CP-S2-17	PP, Putr, manzanita, fescue
	27	CP-F1-11	PP, wooly wyethia
	28	CP-S2-12	PP, Putr, needlegrass
	29	CP-S2-13	PP, Putr, manzanita, needlegrass
	30	CP-S3-11	PP, Putr, snowbrush, needlegrass
	31	CP-S2-15	PP, Putr, sedge
	61	CP-C2-11	PP, Juniper, mahog, Putr, big sage, fescue
	62	CP-H3-11	PP, Aspen, bluegrass
	63	CP-S1-21	PP, mtn. big sage, bluegrass
	33	CL-S2-13	LPP, Putr, forb
.9	55	CL-C1-11	LPP, Wh Bk P, gay penstemon
	32	CP-S2-14	PP, Putr, manzanita, sedge
	58	CL-G4-15	LPP, squirreltail, long stolon sedge
	60	CL-S1-12	LPP, sagebrush
	36	CP-S2-16	PP, Putr, bunchgrass
	37	CP-S1-11	PP, Putr, sagebrush, fescue

.7	16	CL-G3-11	LPP, needlegrass basins
.6	01	CM-S1-11	Mtn Hemlock, grouse huckleberry
	23	CL-S3-11	LPP, manzanita
	35	CL-G4-13	LPP, sedge, needlegrass basin
.5	38	CJ-53-11	Juniper, Putr, bunchgrass
.3	39	SD-29-13	Big sage, Putr, bunchgrass
	40	SD-29-12	Big sage, bunchgrass
.2	53	CJ-S1-12	Juniper, low sage, fescue
	41	SD-33-11	Bitterbrush, needlegrass, sedge
	44	MW	Wet meadow
	45	MM-90	Moist meadow
	51	MW-19-11	Sedge wet meadow
.1	34	GB-99	Bluegrass scabland
	42	SD-19-13	Low sage, fescue, squirreltail
	43	SD-19-12	Low sage, fescue
	52	SD-92-12	Low sage, bluegrass, one-spike oatgrass
	46	MD-19-11	Dry meadow
	49	SD-92-11	Low sage, goldenweed, bluegrass
	50	MD-31-11	Bluegrass dry meadow
	54	SS-49-21	Alpine low sage, red fescue
0	47	NB	Barren-rocks
	48	NW	Water

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

PLANT COMMUNITY PRODUCTIVITY POTENTIAL FORAGE RATING

Basis: Highest rated (forage) dominant or understory vegetation type predicted for each community.

1.0	45	MM-90	Moist meadow
	12	CL-M3-11	LPP, blueberry forb wetland
	13	CL-M1-11	LPP, sedge, grass, wetland
	70	CW-H2-11	WF, PP, Aspen, long stolon sedge
	37	CP-S1-11	PP, Putr, sagebrush, fescue
	61	CP-C2-11	PP, Juniper, mahog, Putr, big sage, fescue
	62	CP-H3-11	PP, Aspen, bluegrass
	38	CJ-S3-11	Juniper, Putr, bunchgrass
	46	MD-19-11	Dry meadow
	50	MD-31-11	Bluegrass dry meadow
	59	CL-H1-11	LPP, Aspen, strawberry
.9	26	CP-S2-17	PP, Putr, Manzanita, fescue
.8	04	CW-S1-12	Mx-con, snowbrush, manzanita
	07	CP-S3-12	PP, Putr, snowbrush, sedge
	36	CP-S2-16	PP, Putr, bunchgrass
	25	CP-S2-11	PP, Putr, fescue
	30	CP-S3-11	PP, Putr, snowbrush, manzanita
	32	CP-S2-14	PP, Putr, manzanita, sedge
	63	CP-S1-21	PP, mtn big sage, bluegrass
	39	SD-29-13	Big sage, Putr, bunchgrass
	14	CL-S9-11	LPP, snowbrush, manzanita
.7	65	CW-S3-13	WF, PP, snowberry, starwort
	66	CW-S1-17	WF, PP, manzanita, Ore. grape
	27	CP-F1-11	PP, wooly wyethia
	28	CP-S2-12	PP, Putr, needlegrass
	29	CP-S2-13	PP, Putr, manzanita, needlegrass
	31	CP-S2-15	PP, Putr, sedge
	40	SD-29-12	Big sage, bunchgrass
	15	CL-S2-14	LPP, Putr, fescue
	33	CL-S2-13	LPP, Putr, forbs
.6	09	CW-S1-16	Mx-con, snowbrush, sq. cpt., strawberry
	05	CW-S1-15	Mx-con, snowbrush, sedge
	10	CW-S3-12	WF, snowberry, strawberry
	41	SD-33-11	Putr, needlegrass, sedge
.5	06	CW-S1-14	Mx-con, snowbrush
	02	CW-H1-11	Mx-con, snowbrush, chinkapin
	67	CW-C4-12	WF, PP, Sug P, manzanita
	53	CJ-S1-12	Juniper, low sage, fescue
	42	SD-19-13	Low sage, fescue, squirreltail
.4	68	CW-C1-11	WF, PP, IC, serviceberry
	52	SD-92-12	Low sage, bluegrass, onespike oatgrass
	17	CL-S2-12	LPP, Putr, sedge
	19	CL-S2-15	LPP, currant, Putr, needlegrass

.3	69	CW-C4-11	WF, PP, WWP, sticky currant
	43	SD-19-12	Low sage, fescue
	18	CL-S2-11	LPP, Putr, needlegrass
	11	CL-M2-11	LPP, bearberry
	20	CL-G4-11	LPP, sedge, lupine
	22	CL-G3-13	LPP, needlegrass, linanthostrum
.2	44	MW	Wet meadow
	64	CW-C3-11	WF, LPP, long stolon sedge, needlegrass
	51	MW-19-11	Sedge wet meadow
	49	SD-92-11	Low sage, goldenweed, bluegrass
	54	SS-49-21	Alpine low sage, red fescue
	01	CM-S1-11	Mtn Hemlock, grouse huckleberry
	23	CL-S3-11	LPP, manzanita
	57	CL-G3-15	LPP, strawberry, fescue
	58	CL-G4-15	LPP, squirreltail, long stolon sedge
	24	CL-S4-12	LPP, grouse huckleberry
.1	03	CR-S1-11	Mx-con, manzanita
	34	GB-99	Bluegrass scabland
	16	CL-G3-11	LPP, needlegrass basins
	35	CL-G4-13	LPP, sedge, needlegrass basins
	55	CL-C1-11	LPP, Wh Bk P, gay penstemon
	56	CL-C1-12	LPP, Wh Bk P, WWP, sandwort
	08	CL-F1-11	LPP, forb
	21	CL--G3-14	LPP, needlegrass, lupine
0	47	NB	Barren-rocks
	48	NW	Water

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

ALPHABETIC LISTING OF DOMINANT AND UNDERSTORY VEGETATION

<u>Code</u>	<u>Vegetation</u>
M2X	All conifer stands w/ HTH silv. models
M1X	All conifer stands w/ SPC silv. models
HA	Aspen
NB	Barren-rocks
BB	Bearberry
SB	Big sage, Big sage-grass
ST	Bitterbrush
CV	Ceanothus
CVF	Ceanothus Brushfield
CT	Currant
GL	Dry Meadows, bunchgrass, seedlings
RY	Gray Rabbitbrush
SR	Green rabbitbrush
HB	Huckleberry-blueberry
KXP	Juniper 10-40 TPA
KXM	Juniper, 40-70 TPA
KXG	Juniper, 70+ TPA
SL	Low sagebrush
LX2	LPP, old, dry, 40+ years old
LX3	LPP, old, wet, 40+ years
LX4	LPP, Young, dry, 10-40 years old
LX1	LPP, Young, wet, 10-40 years
MZ	Manzanita
MZF	Manzanita Brushfield
WM	Moist Meadow
SX	Mountain Mahogany
GF	Perennial Forbs
M4P	Pine-assoc. large sawtimber, HRG, less than 40% cr. cl.
M4G	Pine-assoc. large sawtimber, HRG, 40%+ cr.cl.
M3P	Pine-assoc. small sawtimber, HRG, less than 40% cr. cl.
M3G	Pine-assoc. small sawtimber, HRG, 40%+ cr. cl.
M6G	Pine-assoc., two-storied, HFR
UX	Plantations w/ seedlings less than 1.5' tall
PLP	Plantations with saplings 1.5-4.5' tall
PAC	Plantations 4.5' tall to 15 years old
P4P	PP large sawtimber, HRG, less than 39% cr. cl.
P3M	PP sawtimber, HRG, 40-60% cr.cl.
P3G	PP sawtimber, HRG, 40% cr. cl.
P3P	PP small sawtimber, HRG, less than 39% cr. cl.
P6G	PP two-storied, HFR
SV	Serviceberry
SN	Snowberry

NW	Water
GH	Weeds-annual grasses
WW	Wet Meadows
W4G	WF large sawtimber, HRG, 40%+ cr. cl.
W3G	WF small sawtimber, HRG, 40%+ cr. cl.
W6G	WF two-storied, HFR
W4P	White-fir large sawtimber, HRG, less than 39% cr.cl.
W3P	White-fir small sawtimber, HRG, less than 39% cr. cl.

ALPHABETIC LISTING OF PLANT COMMUNITIES

54	SS-49-21	Alpine low sage, red fescue
47	NB	Barren-rocks
40	SD-29-12	Big sage, bunchgrass
39	SD-29-13	Big sage, Putr, bunchgrass
41	SD-33-11	Bitterbrush, needlegrass, sedge
50	MD-31-11	Bluegrass dry meadow
34	GB-99	Bluegrass scabland
46	MD-19-11	Dry meadow
53	CJ-S1-12	Juniper, low sage, fescue
38	CJ-53-11	Juniper, Putr, bunchgrass
52	SD-92-12	Low sage, bluegrass, one-spike oatgrass
43	SD-19-12	Low sage, fescue
42	SD-19-13	Low sage, fescue, squirreltail
49	SD-92-11	Low sage, goldenweed, bluegrass
59	CL-H1-11	LPP, Aspen, strawberry
11	CL-M2-11	LPP, bearberry
15	CL-S2-14	LPP, bitterbrush, fescue
18	CL-S2-11	LPP, bitterbrush, needlegrass
17	CL-S2-12	LPP, bitterbrush, sedge
12	CL-M3-11	LPP, blueberry wetland
19	CL-S2-15	LPP, currant, Putr, needlegrass
08	CL-F1-11	LPP, forb
24	CL-S4-12	LPP, grouse huckleberry
23	CL-S3-11	LPP, manzanita
16	CL-G3-11	LPP, needlegrass basins
21	CL-G3-14	LPP, needlegrass, lupine
22	CL-G3-13	LPP, needlegrass, lupine, linanthostrum
33	CL-S2-13	LPP, Putr, forb
13	CL-M1-11	LPP, sedge, grass wetland
20	CL-G4-11	LPP, sedge, lupine
35	CL-G4-13	LPP, sedge, needlegrass basin
14	CL-S9-11	LPP, snowbrush, manzanita
58	CL-G4-15	LPP, squirreltail, long stolon sedge
57	CL-G3-15	LPP, strawberry, fescue
55	CL-C1-11	LPP, Wh Bk P, gay penstemon
56	CL-C1-12	LPP, Wh Bk P, WWP, sandwort
60	CL-S1-12	LPP, sagebrush
45	MM-90	Moist meadow
01	CM-S1-11	Mtn Hemlock, grouse huckleberry
03	CR-S1-11	Mx-con, manzanita
06	CW-S1-14	Mx-con, snowbrush
02	CW-H1-11	Mx-con, snowbrush, chinkapin
04	CW-S1-12	Mx-con, snowbrush, manzanita
05	CW-S1-15	Mx-con, snowbrush, sedge
09	CW-S1-16	Mx-con, snowbrush, sq. carpet, strawberry

62	CP-H3-11	PP, Aspen, bluegrass
61	CP-C2-11	PP, Juniper, mahog, Putr, big sage, fescue
63	CP-S1-21	PP, mtn. big sagebrush, bluegrass
36	CP-S2-16	PP, Putr, bunchgrass
25	CP-S2-11	PP, Putr, fescue
26	CP-S2-17	PP, Putr, manzanita, fescue
29	CP-S2-13	PP, Putr, manzanita, needlegrass
32	CP-S2-14	PP, Putr, manzanita, sedge
28	CP-S2-12	PP, Putr, needlegrass
37	CP-S1-11	PP, Putr, sagebrush, fescue
31	CP-S2-15	PP, Putr, sedge
30	CP-S3-11	PP, Putr, snowbrush, needlegrass
07	CP-S3-12	PP, Putr, snowbrush, sedge
27	CP-F1-11	PP, wooly wyethia
51	MW-19-11	Sedge wet meadow
48	NW	Water
44	MW	Wet meadow
64	CW=C3-11	WF, LPP, long stolon sedge, needlegrass
70	CW-H2-11	WF, PP, Aspen, long stolon sedge
68	CW-C1-11	WF, PP, IC, serviceberry
66	CW-S1-17	WF, PP, manzanita, Ore. grape
65	CW-S3-13	WF, PP, snowberry, starwort
67	CW-C4-12	WF, PP, Sug P, manzanita
69	CW-C4-11	WF, PP, WWP, sticky currant
10	CW-S3-12	WF, snowberry, strawberry

NUMERICAL LISTING OF PLANT COMMUNITIES

01	CM-S1-11	Mtn Hemlock, grouse huckleberry
02	CW-H1-11	Mx-con, snowbrush, chinkapin
03	CR-S1-11	Mx-con, manzanita
04	CW-S1-12	Mx-con, snowbrush, manzanita
05	CW-S1-15	Mx-con, snowbrush, sedge
06	CW-S1-14	Mx-con, snowbrush
07	CP-S3-12	PP, Putr, snowbrush, sedge
08	CL-F1-11	LPP, forb
09	CW-S1-16	Mx-con, snowbrush, sq. carpet, strawberry
10	CW-S3-12	WF, snowberry, strawberry
11	CL-M2-11	LPP, bearberry
12	CL-M3-11	LPP, blueberry wetland
13	CL-M1-11	LPP, sedge, grass wetland
14	CL-S9-11	LPP, snowbrush, manzanita
15	CL-S2-14	LPP, bitterbrush, fescue
16	CL-G3-11	LPP, needlegrass basins
17	CL-S2-12	LPP, bitterbrush, sedge
18	CL-S2-11	LPP, bitterbrush, needlegrass
19	CL-S2-15	LPP, currant, Putr, needlegrass
20	CL-G4-11	LPP, sedge, lupine
21	CL-G3-14	LPP, needlegrass, lupine
22	CL-G3-13	LPP, needlegrass, lupine, linanthostrum
23	CL-S3-11	LPP, manzanita
24	CL-S4-12	LPP, grouse huckleberry
25	CP-S2-11	PP, Putr, fescue
26	CP-S2-17	PP, Putr, manzanita, fescue
27	CP-F1-11	PP, wooly wyethia
28	CP-S2-12	PP, Putr, needlegrass
29	CP-S2-13	PP, Putr, manzanita, needlegrass
30	CP-S3-11	PP, Putr, snowbrush, needlegrass
31	CP-S2-15	PP, Putr, sedge
32	CP-S2-14	PP, Putr, manzanita, sedge
33	CL-S2-13	LPP, Putr, forb
34	GB-99	Bluegrass scabland
35	CL-G4-13	LPP, sedge, needlegrass basin
36	CP-S2-16	PP, Putr, bunchgrass
37	CP-S1-11	PP, Putr, sagebrush, fescue
38	CJ-53-11	Juniper, Putr, bunchgrass
39	SD-29-13	Big sage, Putr, bunchgrass
40	SD-29-12	Big sage, bunchgrass
41	SD-33-11	Bitterbrush, needlegrass, sedge
42	SD-19-13	Low sage, fescue, squirreltail
43	SD-19-12	Low sage, fescue
44	MW	Wet meadow
45	MM-90	Moist meadow
46	MD-19-11	Dry meadow
47	NB	Barren-rocks
48	NW	Water
49	SD-92-11	Low sage, goldenweed, bluegrass

50	MD-31-11	Bluegrass dry meadow
51	MW-19-11	Sedge wet meadow
52	SD-92-12	Low sage, bluegrass, one-spike oatgrass
53	CJ-S1-12	Juniper, low sage, fescue
54	SS-49-21	Alpine low sage, red fescue
55	CL-C1-11	LPP, Wh Bk P, gay penstemon
56	CL-C1-12	LPP, Wh Bk P, WWP, sandwort
57	CL-G3-15	LPP, strawberry, fescue
58	CL-G4-15	LPP, squirreltail, long stolon sedge
59	CL-H1-11	LPP, Aspen, strawberry
60	CL-S1-12	LPP, sagebrush
61	CP-C2-11	PP, Juniper, mahog, Putr, big sage, fescue
62	CP-H3-11	PP, Aspen, bluegrass
63	CP-S1-21	PP, mtn. big sagebrush, bluegrass
64	CW=C3-11	WF, LPP, long stolon sedge, needlegrass
65	CW-S3-13	WF, PP, snowberry, starwort
66	CW-S1-17	WF, PP, manzanita, Ore. grape
67	CW-C4-12	WF, PP, Sug P, manzanita
68	CW-C1-11	WF, PP, IC, serviceberry
69	CW-C4-11	WF, PP, WWP, sticky currant
70	CW-H2-11	WF, PP, Aspen, long stolon sedge

COMPUTER PROGRAM USER DOCUMENTATION
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION SIX
FEBRUARY 9, 1984

1. DESCRIPTION

Program Name:	Deer Habitat Evaluation
System ID:	LRP
Program Executable:	NEWPROG
Language:	SBC990 Basic
Host Computer:	Texas Instruments DS-990 Model 1
Technical Contact:	Bill Pieratt, Crooked River NG 503-447-4120
Program Revision Date:	February 10, 1984

2. PROGRAM OVERVIEW

This program allows you to create data files for land areas, edit those files, process these files to evaluate deer habitat, and print those files.

3. HABITAT EVALUATION OPERATING INSTRUCTIONS

The following instructions are intended for use by anyone who is using the model to make habitat evaluations on project areas, herd ranges, or portions of herd ranges.

There are four programs on the disk that will be used: one to create the data files to be processed; one to edit those files; one to process the data files and generate reports; and one to print a hard copy of the data files. Both the program and the data files are on the same disk, so it should be loaded into the left-hand disk drive (DS01).

CREATING THE DATA FILES

This is the first program shown on the Disk Menu. It allows you to both create new data files and write over old files. Be careful not to destroy data which you wish to retain. You will be prompted for the name of the data file and, if it already exists, asked whether or not you want to keep it. Next you will be prompted for a four-digit identifier to be placed in the first record of the file. Once these two steps have taken place the actual data entry begins. For data entry, the ENTER key moves the cursor to the previous field and the RETURN key moves it to the right. The records are automatically numbered and cannot be altered by the person entering the data. When a record has been entered, you will be asked if it is correct. Once it is correct, you may continue data entry for this file. If not, you will start the entire process over again - a "no" answer will bring you back to the disk menu. Examples of screen views which include questions and data input follow.

USDA FS TI-990 User Disk Menu
Deer Habitat Program/Data Disk

Ver: 1R0 2/18/1981
LAST USE: 02/07/84

- | | |
|--------------------------------|-----------|
| 1. LMP - Create... data files | 16. _____ |
| 2. blk - _____ | 17. _____ |
| 3. UTL - Alter.... data files | 18. _____ |
| 4. blk - _____ | 19. _____ |
| 5. LMP - Process... data files | 20. _____ |
| 6. blk - _____ | 21. _____ |
| 7. UTL - Print.... data files | 22. _____ |
| 8. blk - _____ | 23. _____ |
| 9. DOC - Documentation | 24. _____ |
| 10. _____ | 25. _____ |
| 11. _____ | 26. _____ |
| 12. _____ | 27. _____ |
| 13. _____ | 28. _____ |
| 14. _____ | 29. _____ |
| 15. _____ | 30. _____ |

99. = READ MENU FROM ANOTHER DISK

SELECT PROGRAM: 1

Key "RETURN"

```

*
*
* Please enter the output file name DS01.WJP1234_
*
*
*
*
* Is DS01.WJP1234 the correct name ?? Y
*
*

```

Key "RETURN"

```

*
*
*
* This file already exists...
* Do you want to save it ??
*
*
*

```

A "yes" answer will take you back to the "Please enter output file name" query.

A "no" answer will allow you to write over an existing file.

```

*
*
* Record      Acres      Dom-Veg      Understory      Productivity
* 000001      100__      PLP          GH              18
*
*
* Is this record correct ?? Y
*
*

```

If correct, key "RETURN" ; if not correct, key "N" and cursor will return to allow changes. Remember "ENTER" will move the cursor to the left.

If the data entry does not fill all available spaces in the field, you will need to key "RETURN" to move the cursor to the next field; if all spaces are filled advance to the next field will be automatic.

[illegible]

If "yes" key "Y" and proceed with new line; if "no" key "N".

```
* Record      Acres      Dom-Veg      Understory      Productivity      *
* 000002      _____      _____      _____      _____      *
*                                     *
*                                     *
*                                     *
*                                     *
* Any more data files ?? Y          *
*                                     *
```

If "yes" key "Y" and create new file as above; if "no" key "N" and menu will return to the screen.

EDITING EXISTING DATA FILES

Selecting this option from the disk menu will allow you to use the basic file editor. You will be prompted for the pathname of the file to be edited. Pathnames are composed of a disk name followed by a filename. An example of this is DS01.DAT1504 ; where DS01 is for disk 1 (left side) and DAT1504 is the name of a data file. The period between the disk name and file name is required. Instructions for the BASIC editor can be found starting on page 5-21 of the "BASIC system programmer's guide". Screen views of the file edit process follow.

```
-----
USDA FS TI-990      User Disk Menu      Ver: 1R0   2/18/1981
Deer Habitat Program/Data Disk      LAST USE: 02/07/84

 1. LMP - Create....      data files      16. _____
 2. blk - _____      17. _____
 3. UTL - Alter.....      data files      18. _____
 4. blk - _____      19. _____
 5. LMP - Process...      data files      20. _____
 6. blk - _____      21. _____
 7. UTL - Print.....      data files      22. _____
 8. blk - _____      23. _____
 9. DOC - Documentation      24. _____
10. _____      25. _____
11. _____      26. _____
12. _____      27. _____
13. _____      28. _____
14. _____      29. _____
15. _____      30. _____

99. = READ MENU FROM ANOTHER DISK
```

SELECT PROGRAM: **3**

```
EDIT FILE
INPUT FILE PATHNAME: DS01.WJP1234
```

```
1 12340111300PLPGH25
2 000002225 P4PST25
3 000003124 UX GH25
4 *EOF
```

The directional arrows will allow you to move the cursor to make changes in the file. Data on a whole line can be erased by keying "ERASE FIELD" key. Blank lines can be inserted by keying "F-3". Data can then be entered in these blank lines.

Once changes are complete, key "F-9"

TEXT EDITOR COMMANDS

QE	- QUIT EDIT	CL	- COPY LINES
SL	- SHOW LINE	ML	- MOVE LINES
FS	- FIND STRING	MT	- MODIFY TABS
DS	- DELETE STRING	MRM	- MODIFY RIGHT MARGIN
RS	- REPLACE STRING	IF	- INSERT FILE
DL	- DELETE LINES	RE	- RESUME EDIT

Enter command and key "RETURN"

[]
--GUIT EDIT

ABORT?: NO

*GUIT EDIT

OUTPUT FILE PATHNAME: DS01.WJP1234
REPLACE?: NO

If changes have been made, and you want to retain them, key "N"
and key "Y" in response to the "REPLACE" query.
If you just wanted to look at the file or do not want to keep changes key
"Y" and the menu will return to the screen.

Once the changes have been recorded on the disk, the menu will return to
the screen.

PROCESSING DATA FILES

This program (third selection on the disk menu) processes the data files created and edited as explained previously. You will be prompted for the name of the input file and asked if this is a summary run only. Then you will be asked if there are any shrub age class ratings. After responding to these prompts, the program will process the data files. The results will be sent to the line printer. First, the individual polygons will be printed out - two to a page. Next a summary page will be printed. During the printing of the summary page, you will be prompted as to whether there any adjustments to make to the existing and/or potential indices. After responding to these questions, the program will finish and return to the disk menu.

Examples of screen views, questions, and inputs follow.

```

USDA FS TI-990                      User Disk Menu
Deer Habitat Program/Data Disk

Ver: 1R0  2/18/1981
LAST USE: 02/07/84

1. LMP - Create....      data files   16. _____
2. blk - _____      data files   17. _____
3. UTL - Alter.....     data files   18. _____
4. blk - _____      data files   19. _____
5. LMP - Process..       data files   20. _____
6. blk - _____      data files   21. _____
7. UTL - Print.....     data files   22. _____
8. blk - _____      data files   23. _____
9. DOC - Documentation    data files   24. _____
10. _____            data files   25. _____
11. _____            data files   26. _____
12. _____            data files   27. _____
13. _____            data files   28. _____
14. _____            data files   29. _____
15. _____            data files   30. _____

99. = READ MENU FROM ANOTHER DISK
  
```

SELECT PROGRAM: 5

```

Is this a summary run only ?? (Y/N)
? Y
ANY SHRUB AGE CLASS RATINGS
? Y
ENTER FORAGE RATING
? 1
ENTER COVER RATING
? .8
DO YOU WANT TO MAKE ADJUSTMENTS TO THE EXISTING AREA INDEX
BECAUSE OF WATER DISTRIBUTION, ROAD DENSITY, LIVESTOCK UTILI-
ZATION, FIRE OCCURENCE, OR COVER-FORAGE RATIO
? Y
WATER
? 1
ROADS
? .9
LIVESTOCK USE
? .8
TYPE W FOR WINTER COVER-FORAGE RATIO, OR
TYPE S FOR SUMMER/TRANSITION COVER-FORAGE RATIO
? S
DO YOU WANT TO MAKE ADJUSTMENTS TO THE POTENTIAL AREA INDEX
BECAUSE OF WATER, ROADS, FIRE BEYOND MANAGEMENT CONTROL
? N
  
```

AREA SUMMARY REPORT
~~~~~

(FOR: DS01.WJP1234 )

TOTAL AREA ACRES = 11849

EXISTING AREA FORAGE INDEX = 0.55

EXISTING AREA COVER INDEX = 0.30

POTENTIAL AREA FORAGE INDEX = 0.80

POTENTIAL AREA COVER INDEX = 1.00

ADJUSTED AREA SUMMARY REPORT

TOTAL AREA ACRES = 11849

EXISTING AREA INDEX = (EXISTING AREA FORAGE INDEX) \* (COVER ADJ VALUE)

0.44 = ( 0.55 ) \* ( 0.80 )

COVER:FORAGE RATIO IS 0.02 : 0.98

ADJ EXISTING AREA INDEX = (EXISTING AREA INDEX) \* (H2O) \* (RDS) \* (LVSTK) \* (

0.06 = ( 0.44 ) \* ( 1.00 ) \* ( 0.90 ) \* ( 0.80 ) \* ( 1.00 ) \* (

POTENTIAL AREA INDEX = (POT AREA FORAGE INDEX) \* (COVER ADJ VALUE)

0.80 = ( 0.80 ) \* ( 1.00 )

ADJ POTENTIAL AREA INDEX = (POT AREA INDEX) \* (H2O) \* (RDS) \* (FIRE)

0.80 = ( 0.80 ) \* ( 1.00 ) \* ( 1.00 ) \* ( 1.00 )



## PRINTING DATA FILES

The fourth selection on the menu is for printing data files. You will be asked for the file pathname. One copy is automatically programmed for you. Examples of screen views and input follow.

USDA FS TI-990                      User Disk Menu                      Ver: 1R0    2/18/1981  
Deer Habitat Program/Data Disk                      LAST USE: 02/07/84

|                        |            |           |
|------------------------|------------|-----------|
| 1. LMP - Create....    | data files | 16. _____ |
| 2. blk -               |            | 17. _____ |
| 3. UTL - Alter....     | data files | 18. _____ |
| 4. blk -               |            | 19. _____ |
| 5. LMP - Process...    | data files | 20. _____ |
| 6. blk -               |            | 21. _____ |
| 7. UTL - Print.....    | data files | 22. _____ |
| 8. blk -               |            | 23. _____ |
| 9. DOC - Documentation |            | 24. _____ |
| 10. _____              |            | 25. _____ |
| 11. _____              |            | 26. _____ |
| 12. _____              |            | 27. _____ |
| 13. _____              |            | 28. _____ |
| 14. _____              |            | 29. _____ |
| 15. _____              |            | 30. _____ |

99. = READ MENU FROM ANOTHER DISK

SELECT PROGRAM: **7**

---

PRINT DATA FILES  
FILE PATHNAME: DS01.WJP1234  
NUMBER OF COPIES: 1

---

NAME OF DATA FILE: DS01.WJP1234

12340111500PLPGH25  
000002225 P4PST25  
000003124 UX GH25

## DOCUMENTATION

The last program on the menu is the Documentation program which explains in brief form the general functions which are performed with this model.

```

-----
USDA FS TI-990              User Disk Menu              Ver: 1R0   2/18/1981
                          Deer Habitat Program/Data Disk  LAST USE: 02/07/84

1. LMP - Create....      data files    16. _____
2. blk -                data files    17. _____
3. UTL - Alter.....     data files    18. _____
4. blk -                data files    19. _____
5. LMP - Process...     data files    20. _____
6. blk -                data files    21. _____
7. UTL - Print.....     data files    22. _____
8. blk -                data files    23. _____
9. DDC - Documentation.  24. _____
10. _____          25. _____
11. _____          26. _____
12. _____          27. _____
13. _____          28. _____
14. _____          29. _____
15. _____          30. _____

99. = READ MENU FROM ANOTHER DISK
  
```

SELECT PROGRAM: **9**

### Documentation Info

```

=====
| Welcome to the deer habitat program/data disk. There are three
| programs on this disk that you will be using - one to create the data
| files to be processed, one to edit those files, and one to generate
| reports. After reviewing these instructions you will proceed to the
| CAMMENU, where you may select one of the above programs.
|
|                               Creating the data files
|                               =====
|
| This is the first program shown on the cammenu. It allows you to
| both create new data files and write over old files. Be careful not
| destroy data which you wish to retain. You will be prompted for the
| name of the data file and, if it already exists, asked whether or not
| you want to keep it. Next you will be prompted for a four digit
| identifier to be placed in the first record of the file. Once these
| two steps have taken place the actual data entry begins.
|
=====
  
```

Hit RETURN to continue listing...hit ENTER to begin

### Documentation Info

```

=====
| For data entry, the ENTER key moves you left to the previous field and
| the RETURN key moves you to the right. The records are automatically
| numbered and cannot be altered by the person entering the data. When a
| record has been entered, you will be asked if it is correct. Once it is
| correct you will be asked if there are any more records for this file. If
| so, you may continue data entry for this file. If not, you will be asked if
| there are any more files to be entered. Answering yes will start the entire
| process over again - a no answer will bring you back to the cammenu.
|
|                               Editing existing data files
|                               =====
|
| Selecting this option from the cammenu will allow you to use the basic
| file editor. You will be prompted for the pathname of the file to be edited.
| Pathnames are composed of a disk name followed by a filename. An example of
| this is DS01.DAT1504 ; where DS01 is for disk 1 (left side) and DAT1504 is
|
=====
  
```

Hit RETURN to continue listing...hit ENTER to begin

# Documentation Info

=====

: the name of a data file. The period between the disk name and file name is :  
: required. Instructions for the BASIC editor can be found starting on page :  
: 5-21 of the "BASIC system programmer's guide". :  
: =====

## Processing data files

: This program (third selection on the cammenu) processes the data files :  
: created and edited above. You will be prompted for the name of the input :  
: file and asked if there are any shrub age class ratings. After responding to :  
: these prompts, the program will process the data files - with the results :  
: being sent to the line printer. First, the individual polygons will be :  
: printed out - two to a page. Next a summary page will be printed. During :  
: the printing of the summary page, you will be prompted as to whether there :  
: are any adjustments to make to the existing and/or potential areas. After :  
: responding to these questions, the program will finish and return to cammenu. :  
: =====

Hit RETURN to continue listing...hit ENTER to begin

## Documentation Info

- 1-9-84 :
1. You now have the capability to print only a summary page.
  2. Data files may reside on either disk drive.
  3. An option to print your data files has been added to the cammenu.

=====

: HAVE FUN WITH THIS :  
: =====

Hit RETURN to continue listing...hit ENTER to begin

## APPENDIX B

## COMPUTER OPERATING INSTRUCTIONS FOR BASIC USERS

## B.0 INTRODUCTION

This appendix is intended to familiarize the user with the general aspects of operating the system under control of the BASIC language interpreter.

The system is a single-station, desk top unit, and consists of the following:

- A. A computer unit which includes a keyboard unit which resembles a standard typewriter, and a CRT (display screen),
- B. Two or more disk drives and
- C. A printer

Information on controls and operation can be found in the document entitled OPERATOR SERVICE MANUAL.

## B.1 LEARNING THE KEYBOARD

Familiarity with several keys on the keyboard is essential for normal operation. To put the System in a state to perform the operations listed below, strike the F9 key, type the letters NEW, and then the key labeled RETURN. At this point a period should appear in the lower left hand corner.

NUMBERS - Note that numbers exist both on the numeric pad on the far right, and along the top row of the typewriter pad in lower case. Either set may be used.

SHIFT - Many keys have both an upper case and lower case function. The Shift keys control this selection as they do on any typewriter.

UPPER CASE LOCK - This latching key alternates. On alternate depressions, it latches either up or down. It only effects the letters A through Z. When down, letters will always be upper case; when up letters will always be lower case (unless the shift key is used). Normally, the UPPER CASE LOCK should be down. The UPPER CASE LOCK will have no effect on the number and special character keys, only letters.

LEFT AND RIGHT ARROW KEYS - On the far left, locate the keys labeled with left and right arrows. These keys move the typing position on the screen as indicated. To

demonstrate this feature, type the digit 1 about four times. The solid block on the screen which indicates typing position is called the cursor. Now depress the left arrow (cursor left) key twice and observe the results on the screen. Type four digit 2's. Note they overstrike the old 1's. Now run the cursor back and forth with the arrow keys (cursor left and cursor right) and type more information.

**ERASE INPUT** - The ERASE INPUT key is located in the center on the left above the left and right cursor. Its purpose is to erase all input keyed on a given line. Type some information and then strike ERASE INPUT and observe the results.

**HOME** - The HOME key is located in the center of the lefthand pad. It will return the cursor to the extreme left. Type information and then strike HOME and observe the results.

**ERASE FIELD** - Located on the extreme upper left of the keyboard, this key clears all information on the line to the right of and under the cursor. Type some information, then use left cursor to reposition the cursor in the middle of the typed data. Strike ERASE FIELD and observe the results.

**OVERSTRIKING** - By now, you will have noted that information can be keyed on top of old information and the new prevails. Practice this by typing data, using left cursor or HOME and then overstriking with new data. Try overstriking with spaces and observe the results.

**DELETE CHARACTER** - This key is located on the pad on the far left and deletes the character under the cursor. Type information on the line. Then position the cursor somewhere in the middle of the information. Strike delete character several times observing the result.

**INSERT CHARACTER** - This key, located on the far left, when depressed, places the system in Insert Mode. When in Insert Mode, all characters typed are inserted at the cursor position and other data to the right is shifted over to make room if possible. Insert Mode is terminated by the Cursor Left, Cursor Right, HOME, DEL CHAR, or RETURN key. Type information on the line and position the cursor in the middle. Strike INS CHAR, then type more data and observe the results. Then strike Left Cursor and type more data observing the Insert Mode is no longer active.

**RETURN** - In normal use, every input must be terminated by the RETURN key in order for the system to accept and use the information. Up until the time you strike the RETURN key, you may still correct data in the field by

any of the methods discussed above. However once the RETURN is keyed, the system will process the information as displayed. Note that the cursor location within the field makes no difference. When RETURN is struck, the entire field is processed. To practice this, clear any extraneous data using ERASE INPUT. Then key the number 1234 followed by RETURN. Key 1234, then place the cursor over the 2 and strike RETURN. Type ABCD followed by RETURN. This is an invalid input and will precipitate an error message, but no harm is done. Now strike RETURN several times and observe the acceptance of empty input.

PAPER ADV - This key is not active.

PRINT - This key will cause the entire content of the CRT screen to be printed. Make sure that the printer is turned on and on-line.

## B.2 DESK CALCULATOR

Whenever the system is in the state with the period in the lower left, the processor may be used as a calculator. Find the F1 key on the left end of the top row. This key corresponds to the "Equals" key of a calculator.

Type  $1+1+3$  then strike F1 and observe the answer being displayed. Note, the new period prompt is now in the middle of the same line. This is normal and more input can be typed there. If the prompt on the same line disturbs you, strike the RETURN key and a fresh line will commence.

In any event, try a more complex request. Type  $(2+5)*3 - 5/(2+4)$  followed by F1. Note that parenthesis may be used for grouping and asterisk means multiply and slash means divide. In fact, the symbol that looks like an upside down V over the 6 means "raise to the power of", so  $2^5$  followed by F1 will take the square root of two. REPEAT KEY - On the far left pad, locate REPEAT. Hold it down, then simultaneously hold down another key, say the letter A. Observe that multiple A's are entered until you let go. The REPEAT key is occasionally useful in combination with Left and Right Cursor. Hold down REPEAT and A filling a good portion of the line with A's. Then hold down REPEAT and Left Cursor, then REPEAT and Right Cursor observing the results. F9 and F10 - When the System is running, accidental depression of F9 will stop the program. Try to avoid this occurrence. However should it happen, merely strike F10 and the program will resume.

## B.3 TYPING BYE

To terminate the keyboard experimentation, type the letters BYE and the RETURN key. This will cause the System to restart itself. Normally you should never stop the System while it has some operation in progress, however if all else fails striking F9, typing BYE and RETURN will always restart the system from scratch.

## SBC 990 BASIC System

---

### 3.1 INTRODUCTION

The SBC 990 BASIC system consists of a compact, memory-resident operating system, the SBC 990 BASIC interpreter, a set of system utility programs, and a library of system subroutines.

### 3.2 OPERATING SYSTEM

The operating system performs initialization, resource management, and support functions for the SBC 990 BASIC interpreter. The resources managed by the operating system include the following:

- A microcomputer and associated memory
- The indicator lights on the hardware control panels
- An internal system clock
- A terminal station
- Peripheral mass-storage devices
- The printers

The support functions provided include I/O and file management functions.

The operating system continuously maintains the system date and time by using the internal clock of the computer. The date is automatically adjusted at the end of each day.

The operating system and BASIC interpreter together require approximately 38K ( $K = 1024$ ) bytes of memory. Approximately 26K bytes of memory are available for user program storage. This value may vary according to options and the system version in use.

#### 3.2.1 Loading the Operating System

The SBC 990 BASIC operating system (along with the other system software) is supplied to the user on a magnetic disk, called the *system disk* (SBC990). The system disk can be either an FD1000 flexible disk or a DS10 cartridge disk, depending on the disk drives configured in the system. Both the DS990 Model 1 and Model 2 can use the FD1000 disk system; however, only the Model 2 can use the DS10 disk system. To load the operating system, the user must first place the system disk in the drive and then start the initialization sequence.

When the SBC 990 BASIC software is loaded, a sequence of events is triggered, culminating in the activation of the SBC 990 BASIC interpreter. The start-up sequence involves loading into memory



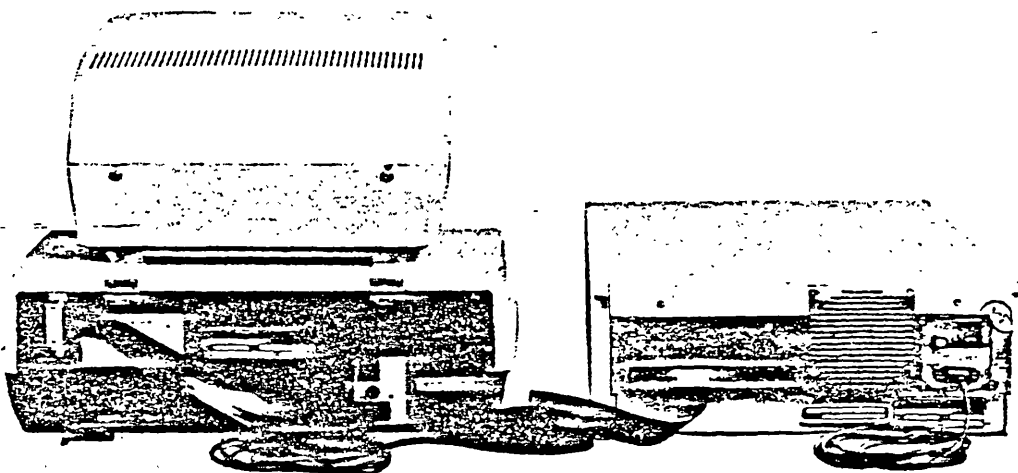
the operating system and the BASIC interpreter from a disk file called the *system file*, and then transferring control to the operating system. The operating system then performs system initialization functions. The sequence of events is as follows:

1. The internal read-only memory (ROM) loader locates the first disk drive that is on-line and connected at TILINE address hexadecimal F800 and reads the bootstrap loader from track 1 of the disk into memory. It then transfers control to the loaded bootstrap loader. If an error occurs while accessing the bootstrap loader, an error message appears on the VDU, and loading aborts. Appendix D lists these error messages.
2. The bootstrap loader obtains the name of the system file containing the SBC 990 BASIC system from the disk. The bootstrap loader then determines if the system file exists on the volume. If not, an error occurs, an error message appears on the VDU, and loading aborts.
3. The bootstrap loader loads the system file into memory and transfers control to the operating system initialization logic. If the bootstrap loader detects an error condition, an error message is displayed on the computer's indicator LEDs (Appendix D) and loading aborts. Whenever possible, the bootstrap loader also displays the error message on the VDU.
4. The operating system initialization logic performs the following functions:
  - a. Initializes the system tables and data areas.
  - b. Initializes the system clock.
  - c. Initializes the VDU and disk drives.
  - d. Reads the system configuration file, loads the device service routines (DSRs) for optional devices, and initializes these devices. The DSRs are always loaded from the disk that contains the system configuration file.
  - e. Activates the SBC 990 BASIC interpreter, which may initiate the start-up program (either the system default start-up program or a user-defined start-up program configured with the Define Startup Program, DSP, utility).

**3.2.1.1 DS990 Model 1 System Disk Installation.** To load the operating system onto the DS990 Model 1 system, the user must perform the following steps:

1. Ensure that the DS990 Model 1 system is properly assembled and powered down. Refer to the *DS990 Model 1 Site Preparation and Installation* manual, for assembly and installation procedures.
2. Remove any disks in the disk drives.
3. Turn on the power to the disk drives. The ac power switch is located at the rear of the disk enclosure.
4. Turn on the power to the DS990 Model 1. The power switch is located at the rear of the terminal (Figure 3-1).

5. Remove the disk labeled SBC 990 BASIC SYSTEM from its protective envelope (with label up and the read/write slot away from you), and insert it into DS01 (the left drive) of the FD1000 system. If the DS990 Model 1 system has more than one FD1000 system, DS01 is located on the FD1000 that has two cables attached to the blue connector on the back of the system.
6. Close the access door by pulling the door handle down. To remove the disk, press the LATCH RELEASE switch. Always return the flexible disk to its protective envelope after use.
7. The system begins loading into memory from the disk drive containing the system disk. Loading is complete after approximately five seconds.



(A)143779

Figure 3-1. Rear View of DS990 Model 1 Configuration

If a start-up program is configured, it is executed immediately after the loading sequence is complete. The system comes to the user configured with the start-up program SBC990.UTIL. This program displays the utilities main menu (Figure 5-1) on the VDU. If no start-up program is configured, a period (.) appears in the lower left-hand corner of the VDU, indicating that the system is in the BASIC command level.

**3.2.1.2 DS990 Model 2 — FD1000 System Disk Installation.** Install the FD1000 system disk on the DS990 Model 2 as follows:

1. Remove the disk labeled SBC 990 BASIC SYSTEM from its protective envelope (with label up and the read/write slot away from you) and insert it into DS01 (the left drive — unit number zero) of the FD1000 system installed at TILINE\* address hexadecimal F800.

\* TILINE is a registered trademark of Texas Instruments, Incorporated.

SITUATION ASSESSMENT  
FOR THE  
DEER HABITAT EVALUATION PROCESS

WINEMA NATIONAL FOREST

KLAMATH COUNTY, OREGON

MARCH, 1984

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## CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

### A. BACKGROUND

The Winema National Forest proposes to develop and implement a strategy for managing mule deer habitat on the area included within the extended boundaries of the former Klamath Indian Reservation.

This action is intended to be responsive to the direction provided in the Consent Decree issued by the 9th Circuit Court, which in recognizing Klamath Indian Treaty Rights enjoined the State of Oregon, the Klamath Tribe, and the U. S. Forest Service to share information and cooperate in the management of wildlife resources on the former Reservation.

The results of this assessment should demonstrate what impact the scheduled and proposed timber harvest activities will have on deer habitat.

This environmental assessment documents the process used to develop habitat management strategies and to select the preferred alternative.

The proposed action would provide direction and guidelines for integrating the management of mule deer habitat with the management of other forest resources.

### B. DECISION TO BE MADE

The decision to be made as a result of this assessment will identify, from a range of available mule deer habitat management strategies, the strategy which will be implemented on the National Forest portion of the former Klamath Indian Reservation.

The strategy chosen will describe habitat management practices, activities, and projects which will be employed. Effects of other resource programs and activities will be described. The habitat diversity and distribution which will be achieved will be depicted, along with the projected output levels of forage production or deer population levels. A final aspect of the strategy will be the project cost of implementation.

### C. DECISION CRITERIA

Each alternative will be evaluated based of the degree to which it will:

1. Meet assigned RPA targets in the program areas of wildlife, timber, and recreation.
2. Meet the intent and direction of the Consent Decree in conjunction with the capabilities of the land.
3. Provide relative economic efficiency in terms of the cost of implementation.

### D. ISSUES, CONCERNS, AND OPPORTUNITIES

1. The Klamath Tribe, some members of the public, and the various local resource agencies share a concern that adequate distribution of the basic habitat components, such as forage, cover, and water, be pro-

vided for and maintained in an optimum spacial relationship.

2. The Forest Service, Klamath Tribe, and the Oregon Department of Fish and Wildlife are concerned about the need to improve deer forage diversity and nutritional value.
3. The Klamath Tribe is concerned that the limited deer winter range currently existing on the Winema N. F. may not be capable of supporting the desired number of "local" deer.
4. There may be an opportunity to expand the area currently being managed for deer winter range emphasis.
5. There is a concern that some available summer range is being underutilized by deer due to a lack of available water.
6. There is a concern about what effect livestock grazing is having on deer habitat (forage and water).
7. The Klamath Tribe is concerned that the existing transportation system is producing a decrease in deer herd size.
8. There is an opportunity for increased cooperation in deer habitat management among the Klamath Tribe, local, County, State, and Federal Governments.
9. There is a concern over just what the National Forests' role is in providing for deer winter range.
10. The harvesting schedules and quantities of timber harvest as they influence available deer cover and forage are a concern.
11. There is a concern over the number of deer harvested compared to the number of deer available.
12. The mountain pine beetle epidemic and the proposed treatment is a concern as it relates to effects on deer habitat.
13. There is a general concern over a decrease in deer herd size.
14. There may be an opportunity to extend the effective boundaries of managed deer winter ranges through the use of cooperative agreements or memoranda of understanding with private landowners.

## CHAPTER 2. ALTERNATIVES

This chapter presents the alternatives considered by the Forest Service. The chapter is divided into two sections: (A) alternatives eliminated from detailed consideration, and (B) alternatives considered in detail during the environmental analysis.

### A. ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

The Forest Service considered a wide range of alternatives in order to assess the reasonableness of the alternatives to be considered in detail. Those alternatives eliminated from detailed consideration, along with the rationale for their dismissal, are as follows:

1. Manage a habitat level which would support as minimally viable population of mule deer. Since the purpose of this analysis is to examine strategies which would support population levels of deer which would be utilizable by the Klamath Tribe in exercising their treaty hunting rights, this alternative was eliminated from detailed consideration because a minimum viable deer population would not satisfy the subsistence hunting need.
2. Manage deer habitat components in such a way as to maintain current summer range emphasis and productivity while reducing the area of winter range emphasis. This would produce a winter range area which would be significantly smaller in size and of reduced carrying capacity from the desired and historic size and capacity. To follow this course of management would seem to be to continue an undesirable trend and to fail to satisfy subsistence hunting need. This alternative was therefore eliminated from detailed consideration.
3. Manage the habitat components in such a way as to maintain current winter range emphasis area while increasing the productivity of the summer range emphasis area. Since the winter range carrying capacity is the limiting component the pursuit of this strategy would not contribute to the achievement of any deer population expansion or improvement objective. For this reason this alternative was eliminated from detailed consideration.

### B. ALTERNATIVES CONSIDERED IN DETAIL

The Forest Service developed four alternatives for detailed analysis. These alternatives respond to the issues and concerns listed in Chapter 1, and the range of alternatives is considered reasonable given the biological characteristics of the area and the realistic capabilities available for manipulating vegetation.

The Forest Service, ODFW, and the Klamath Tribe will monitor mule deer populations under any alternative and would respond to indicated changes in habitat management strategy based on this monitoring.

Regardless of the alternative chosen, the following direction and constraints would apply to the management of mule deer habitats:

1. Desired cover-forage ratio will be 40-60 on summer range.
2. Desired cover-forage ratio will be 50-50 on winter range.
3. The cover component of winter range will be divided equally between hiding cover and thermal cover.
4. Fawning habitat should be maintained or enhanced within 600 feet of water sources.
5. Disturbing human activities in deer fawning habitat will not be permitted from May 15 through July 15.
6. Major movement patterns and migration routes of big game should be considered in planning and implementing project activities.
7. Disturbing human activities in deer winter range will not be permitted from November 15 through March 15.
8. Blocks of untreated area which are of logical future management size will be left between regeneration units so that proper diversity can be maintained and provided in the future.

NOTE: This direction and constraint list is a combination of current N.F. direction and that provided in the BLUE MOUNTAIN HABITAT GUIDES edited Jack Ward Thomas.

Alternative 1 - Continue current direction (No Action Alternative)  
Current mule deer winter range management emphasis would be applied to 25000 acres within the planning area. Sixty per cent of the winter range will be managed for thermal cover. This component will consist of low vegetation, shrubs, or trees over five feet tall or a stand of coniferous trees having at least sixty per cent crown closure. The remaining forty per cent of the winter range area will be managed for winter forage production. Browse production will be encouraged through the use of prescribed fire and the control of tree stocking densities. Yearlong water developments should be held to minimum to discourage year-long residence of deer.

The remainder of the planning area will be managed for spring-summer-fall deer habitat. (Approximately 631,214 acres.) In general forty per cent of the area will be managed for the cover component and sixty per cent will be managed for the forage component. Where the distribution of these components less than optimum, timber harvest and other cultural activities will be used to bring about a distribution pattern which will be more desirable in the long term. Where habitat is underutilized due to a lack of water, investments will be made to construct developments which will increase deer use in these areas.

Alternative 2 - Under this alternative the area of winter range emphasis would be increased to include all areas below 5200 feet elevation on the Chiloquin Ranger District. This would provide winter range emphasis area of approximately 38,310 acres. Thermal cover will be provided on sixty per cent of the area and will consist of low vegetation, shrubs, or trees over five feet tall or a stand of coniferous trees having at least sixty per cent crown closure. Again browse production will be encouraged by using prescribed fire treatments or the control of tree stocking densities.



All areas above 5200 feet elevation on the Chiloquin R. D. (617,904 acres) will be managed with a deer summer range emphasis. In general forty per cent of the area will be managed for the cover component and sixty per cent will provide the forage component.

As in Alternative 1, where the distribution of these components is not optimum, timber harvest and other cultural practices will be used to provide a more desirable long-term distribution pattern. Where opportunities exist, through investments, to improve deer utilization, improvement projects should be considered.

Alternative 3 - This alternative provides for continuing the winter range emphasis the currently recognized deer winter range areas (25000 acres), and for decreasing the size of area receiving summer range management emphasis. This would provide for current proportions of winter forage and cover production with the same distribution objectives. Deer summer range emphasis would be prescribed for 25 percent fewer acres than in Alternative 1. (approx. 156,000 fewer acres). The acres on which deer habitat management emphasis would be absent would be available for full commodity production.

Alternative 4 - This strategy provides for reducing the acres on which both summer and winter range emphasis is applied. The area of deer winter range emphasis will be 25 percent less than found in Alternatives 1, while the area of deer summer range emphasis will be 33 percent less than found in Alternative 1. Cover-forage ratios and component distribution objectives will remain the same for the areas of emphasis as are found in the other alternatives. This alternative will provide winter range emphasis for approximately 18,750 acres and summer range emphasis for approximately 423,000 acres.

## CHAPTER 3. AFFECTED ENVIRONMENT

### A. SOCIAL AND ECONOMIC SETTING

The economy influenced by the area within the extended boundaries of the former Klamath Indian Reservation is regionally oriented and highly specialized. Timber and agriculture are the basic industries. Many goods and services produced in Klamath County are used by county residents, but the primary industries export many products. Over half of the agricultural products are sold locally, but 85-90% of the timber products are sold outside the areas.

The timber industry and its employees purchase a majority of the goods and services produced in the two counties. Jobs that stem from timber growing, harvesting, and processing are dominant in the County's economy. Agriculture and those employed in this industry are the second largest purchaser followed by manufacturing and processing. Substantial business activity associated with recreational activities occurs in local communities. Outdoor recreational activities include hunting, fishing, skiing, snowmobiling, visiting Crater Lake National Park, as well as others.

The social and economic future of the area depend on what new or diversified industries are attracted to the area as well as the extent to which current industry expands.

A more detailed discussion of the social and economic setting of the area can be found in the current Timber Resource Plans for the Klamath Basin Working Circle, the Work Plan for Land and Resource Management Planning for the Winema N. F. and in the inventory documents developed by the National Forest as part of the Forest Planning Process.

### B. PHYSICAL AND BIOLOGICAL SETTING

A detailed discussion of the physical and biological setting on the Winema National Forest can be found in the sources cited in the preceding paragraph. The following is a highlight summary of the various aspects of the physical and biological segments of the environment.

#### Topography

Terrain in the area is mostly flat or rolling. Elevations vary from 4000 feet to 7000 feet.

Most of the area is in the regionally recognized Basin-Range Physiographic Province which is characterized by block faulting. Broad, flat valleys alternate with north-trending ridges. Meandering streams and rivers flow through the lowlands. Cinder cones, lava flows, and air-laid pumice are common in various parts of the area.

#### Soils

Soil groups on the area fall into two main groups: (1) those derived from pumice and ash, and (2) those derived from weathered basalts, andesites, breccias, pyroclastics, and sedimentary rocks. Thus a wide

range of soil properties exist. Fertility, erosion potential, and potential for frost heaving are some of the more important ones to consider.

#### Climate

The climate is usually warm and dry in the summer and cold and dry in the winter. Precipitation averages about 20 inches per year in the commercial forest zones with lesser amounts common in lower elevation plant communities.

#### Water

Water is produced primarily from snowpack at the upper forested elevations which melts during the late spring months. Streams and springs are relatively well distributed over the area with the exception of the northern portion of the Winema N. F. Water quality is relatively high, however, late season, low-flow conditions result in some quite high water temperatures and quite reduced levels of dissolved oxygen in portions of the Sprague and Sycan Rivers.

#### Plant Communities

The wide variation in topography, precipitation, and soil has resulted in the development of several major plant communities. Major groups include Sub-Alpine Forest and Meadows, Pure and Associated Ponderosa Pine, Lodgepole Pine, Big and Low Sagebrush, Moist and Dry Meadows.

#### Air

Air quality in the area is generally excellent. Smoke sometimes results from the burning of logging slash or agricultural fields, but the smoke usually dissipates quickly. Prescribed use of broadcast burning for general fuels management is becoming more common. Smoke from all these sources must be managed carefully to maintain air quality.

#### Wildlife and Fish

Many varieties of wildlife are found within the area. Species lists can be found in the source documents listed previously. Some of the more important habitats in the area are riparian zones, old-growth timber stands, mule deer winter and summer ranges, and the streams and lakes that support fish life. A detailed presentation of deer habitats is presented in the appendix as a biological evaluation.

A general picture of deer habitat is that on summer ranges there is an excess of cover areas and a shortage of forage areas based on an optimum ratio of 40% cover and 60% forage. When compared to an optimum ratio on winter ranges of 60% cover-40% forage, the general picture is that the existing winter ranges are lacking cover and more foraging areas than needed. The condition of forage on winter ranges is fair to good. Forage on summer ranges appears to be nutritionally limited due to less than desirable variety and old-age stands of bitterbrush. This reduced variety and old-age condition is the result of man's efforts to keep fire out of the forest and the nature of logging prac-

tices, i.e., salvage and light intensity cutting which discouraged the development of new, young stands of bitterbrush. As timber stands became older and crown-closure increased, the grass and forb components of the understory were gradually crowded out which also resulted in a less diverse combination of plant species.

Currently the deer which reside within the area being considered are subjected to hunting pressures from three sources. The ODFW hunting season which occurs in October for a period of a few days, hunting by Tribal members according to the Tribal regulations, which generally allows hunting for an average of nine months each, and hunting conducted illegally by those who harvest deer without regard to the regulations of either the State of Oregon or the Klamath Tribe.

#### C. RESOURCE MANAGEMENT PROGRAMS AND SUPPORT ACTIVITIES

This subsection summarizes resource management programs and the associated support activities. A more detailed description can be found in the various plans and planning documents cited earlier in this section.

##### Recreation

This program includes the management of developed and dispersed recreation, visual, and cultural resources, as well as special interest and research-natural areas. Developed recreation use generates the majority of the visitor-days of use. The largest volume of dispersed use is generated during the state deer hunting season.

##### Wilderness

The area under consideration has one legislatively designated wilderness, the Gerhart Wilderness.

##### Wildlife and Fish

This program provides habitat management for all native species of vertebrates with special emphasis on threatened, endangered, and sensitive species. Current direction is to manage for species diversity and viability according to a featured species concept in areas where key habitat values have been identified as necessary for a certain species or species group.

All of the Sprague Management Unit and portions of the Fort Rock, Silver Lake, and Klamath Falls Units lie within the planning area. There are approximately 149 sq. mi. of the Fort Rock summer range included, 205 sq. mi. of Silver Lake summer range, 546 sq. mi. of Sprague summer range and 20 sq. mi. of Sprague winter range, and 305 sq. mi. of Klamath Falls summer range and 19 sq. mi. of Klamath Falls winter range within the extended boundary area.

##### Range

The planning area is grazed by both sheep and cattle. The livestock operations involved make a significant contribution to the economies of Klamath and Lake Counties. The average grazing season is June through September. Livestock grazing occurs on all types of seasonal deer ranges; spring, summer, fall, and winter.

### Timber

For a full discussion of this program refer to the Winema NF Timber Implementation Plan. Prominant features of the program include timber harvest, reforestation, manipulation of young timber stands, genetic tree improvement, and animal damage management.

### Water

This management program consists mainly of water quality monitoring and water uses inventory. Significant water uses are for road construction, dust abatement, recreation, livestock water, wildlife water, and fish habitat.

### Minerals and Energy

Leasable, locatable, and common variety minerals are found in varying amounts in the area. Significant acreages have potential for oil, gas and geothermal development. Recently there has been activity in the area for leasing and exploration.

### Human and Community Development

The emphasis in this program is on activities which provide youth and adult employment and training opportunities.

### Protection

Protection activities include fire management, maintenance of air quality law enforcement, and insect and disease management.

### Lands

The major activities are landline location, land exchanges, rights-of-way acquisition, special uses and other agreements.

### Soils

Major program activities include soil management input and monitoring in conjunction with timber sales, reforestation, road construction, and other projects.

### Facilities

The primary purpose of facilities management activities is to provide and maintain capital improvements such as roads, trails, bridges, buildings, and water systems.

Prior to 1979, there were about 5.5 miles per square mile of open roads on the planning area. These roads were of various standards and were often located in places which were in direct conflict with deer habitat values. In 1979 the Winema N.F. entered into a road management program with an objective of reducing the amount of roads which were open to

the public and which were negatively influencing deer habitat. It was decided that the land could be effectively managed with a road density of 4.0-4.5 miles per square mile. However, not all of these roads really needed to be open for use all the time. Therefore the program took two approaches. Roads which would never be needed for land management would be obliterated. Roads which would only be needed intermittently would be treated with an entrance closure and "stored in place" for future use. The objective for roads which would be open on a constant basis would amount to an average of 2.0-2.5 miles per square mile. The program will be completed in the summer of 1984. The actual mileage of open road will fluctuate with the level of timber harvest activity which takes place. This fluctuation will result in as many as 3.0-3.5 miles of road per square mile being open at times.

The objectives stated here are compatible with the discussion and guidelines presented in the BLUE MOUNTAIN HABITAT GUIDES on page 122 concerning roads.

The Road Management Program will be reviewed during the Forest Land Management Planning process and either revised or reaffirmed for continued future use.

#### CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES

This chapter compares and contrasts the alternatives being considered in detail. Effects on both the physical and socio-economic segments of the environment are described as well as the effects on the various program and support activities.

The habitat capabilities discussed here deal with the physical and biological aspect of deer management and habitat. No attempt is made to assess or describe the social aspects of deer interaction, since little is known about this area.

Habitat capabilities described here are just that: capabilities. There is no guarantee that the number of deer which could be supported in a given habitat will actually be there since there are a number of things which are not biological which influence deer numbers. For example hunting regulations or illegal harvest could have a significant effect on deer numbers in an area which contained good quality habitat capable of supporting high numbers of animals.

Alternative 1: Continue current direction - This alternative would provide sufficient winter range to meet the ODFW winter population objectives on the area. The summer range provided in this alternative would be capable of supporting more deer than are needed to meet the summer population objectives that the ODFW has identified. Subsistence harvest needs and objectives identified by the Klamath Tribe could also be met by the habitat which this alternative would provide. Current livestock grazing programs could continue in all parts of the area under consideration.

More specifically, the ODFW summer population objective for the area is 9.2 deer/sq. mi. on 986 sq. mi. or approx. 9100 deer. The current habitat capability for summer populations is 27 deer/sq. mi. or approx. 26,600 deer.

The ODFW winter population objective for the area is 41.5 deer/sq. mi. on 39 sq. mi. or approx. 1600 adult deer. The current habitat capability is for 41.5 deer/sq. mi. or approx. 1600 adult deer.

This alternative would not require the alteration of current timber management schedules in the short term (2 - 3 decades). It is possible that after the next decade or two that timber harvest entries will need to be smaller in size and more dispersed than has been historic pattern in order to achieve or maintain desired habitat diversity and distribution. By using the habitat model as a futuring tool, it appears that continuing the current timber harvest schedule will result in a healthy and productive deer habitat as long as the management requirements and constraints listed in Chapter 2 are followed. This is primarily due to the fact that current timber management plans will produce young

stands of trees which will provide highly desirable deer habitat conditions. It is also possible that future forage production in managed stands of timber will be less than we currently see in natural due to production effects we are experiencing from mechanical methods of treating precommercial and commercial thinning slash. If the proper prescriptions are not followed in the use of fire in managing fuel loadings, the production of browse, mainly bitterbrush, could be adversely effected.

The implementation of this alternative will not adversely effect other resource and support programs and activities. Current levels of use on the transportation system would continue and would not deter from the achievement of deer population objectives.

Alternative 2: Increase winter range - Decrease summer range - By allocating all area on the Chiloquin R. D. below 5200 feet elevation to winter range emphasis, a wintering area capable of supporting an estimated 2500 wintering adult population would result. This would require a change in management emphasis on approximately 13,000 acres currently being managed for a mix of resource values including deer summer range. The current ODFW population objective would be exceeded by about 900 wintering animals. The resulting summer range area would be capable of providing the habitat necessary to support the number of animals needed to meet the ODFW summer population objectives (ODFW objective is about 9100 animals for the area; habitat capability under this alternative would be approximately 26,000 deer). This alternative would require the development and maintenance of more thermal cover on those acres of added winter range to reach the desired 60 percent cover level.

This alternative would require a reduction in scheduled timber harvest levels, since a larger area would be managed for deer winter range. This output reduction is estimated at 1,500 MBF annually.

The implementation of this alternative would not produce any adverse effect on the recreation or soil and water programs. Support programs and activities would be commensurate with the resource programs dictated by this alternative.

Alternative 3 Maintain Current Winter - Decrease Summer Area - This alternative would provide sufficient winter range to meet the ODFW winter population objectives. The summer range area (742 sq. mi.) would provide habitat suitable for supporting approximately 20,000 animals. This is at least 200 percent of the summer objective and seems totally acceptable. Subsistence



harvest needs and objectives for the Klamath Tribe would also be met.

This alternative would provide opportunity for an estimated increase in timber harvests of 5,000 MBF annually. This is due to the fact that approximately 150,000 acres would be managed for higher timber production than in the previous two alternatives. These acres would not be subject to the general guideline of cover and forage ratios or to any of the other management constraints that restrict or limit programs or activities for deer habitat management reasons.

The implementation of this alternative will not adversely effect other resource and support programs and activities.

Alternative 4: Reduce Both Summer And Winter Range Area - This alternative will provide a summer range capability which will support an estimated 17,800 summering adult deer. This compares to an ODFW summer population objective of 9100 deer. Subsistence harvest needs and objectives identified by the Klamath Tribe would be met. There would be no significant conflicts on summer range between mule deer and domestic livestock.

On winter range the ability to support winter animals would not match up with the ODFW winter population objectives. The ODFW objective is 1600 wintering adults. The winter habitat capability under this alternative would be approximately 1250 wintering adults. In view of this, the summer range capacity would not be efficiently utilized due to limiting winter capacity. There would be a reduction in the contribution made by recreational hunting to the economies of the two Counties. It is also probable that in the long-term subsistence hunting by Tribal members would be possible only at levels below those which are desired by the Tribe.

Since fewer acres would receive winter range emphasis, this alternative would provide opportunity for timber harvest levels which would be higher than those currently scheduled. This is due primarily to the fact that there would be more acres which would have fewer production and operational restrictions applied than in the other alternatives.

If this alternative were implemented, the resource programs and support activities in the areas of recreation, transportation, and soil and water would not be materially influenced, especially in an adverse manner.

## CHAPTER 5. LIST OF PREPARERS

The following list contains the names of those individuals who prepared and assisted in the preparation of this document:

William J. Pieratt---Chiloquin District Ranger  
Jack V. Inman--Winema NF Wildlife Biologist  
Lenard Morin-- WNF Planning Staff Officer  
Jack Mathews-- WNF Resource Staff Officer  
Art DuFault-- WNF Forest Supervisor  
Joe Cruz-- WNF Timber Staff Officer  
Jerry Hofer-- WNF Asst. Timber Staff Officer

## CHAPTER 6. CONSULTATION WITH OTHERS

### A. Parties Who Contributed Information To This Document

In addition to those individuals mentioned in Chapter 5, the following people contributed information to this document:

Ralph Opp--Klamath District Biologist, ODFW  
 Craig Bienz--Klamath Tribal Biologist  
 Garwin Carlson-- WNF Soil Scientist  
 Chris Hescok--Chiliquin District Wildlife Biologist  
 Gene Silovsky-- Fremont NF Wildlife Biologist  
 John Toman--Wildlife Biologist, ODFW  
 Orville Grossarth--Fremont NF Forest Supervisor  
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### B. Agencies, Organizations, and Persons Who Were Contacted Concerning This Document

Oregon Department of Fish and Wildlife  
 Klamath Tribe  
 Modoc National Forest  
 Dave Christy--Klamath Falls Herald & News  
 Dick Pedersen--Big Game Biologist, USDA Forest Service, R-6

### C. Project Scoping

Scoping for this Assessment was conducted at various times in several meetings and discussions which include meetings with the Klamath Tribal Chairman, Chuck Kimbol, Klamath Tribal Executive Committee, Annual Meeting between the Winema NF and District Personnel of ODFW, and discussions involving those persons previously identified as contributors.

### D. Public Information and Involvement

No specific Public Involvement activities were conducted during this Assessment process. Public information was provided through the issuance of a newspaper story and through contacts with interest parties and groups.

## APPENDIX A: CURRENT MGT. PRESCRIPTION - DEER WINTER RANGE

WINEMA NF - Ponderosa Pine - Lone Pine Area - The objective is to provide habitat that will minimize energy loss during the period when energy expended from normal activities exceeds energy intake from the animal's environment. To accomplish this 60 percent of the winter area will be managed as thermal cover. Vegetative stands will express sixty percent crown closure. The present vegetative situation is an old burn (1930's) partially stocked with 10-20 year-old ponderosa pine seedlings and a brush cover consisting of ceanothus, manzanita, and bitterbrush.

As stands reach 140 years and about 20 inches d.b.h., they will be entered with a regeneration-shelterwood harvest. About 20 trees per acre will be left for shelter and the new stand will be established at 600 trees per acre. If an acceptable understory exists, it will be retained. In 5 years, following the establishment of the new stand; the remaining overstory shelter trees will be removed.

At age 35, a precommercial thinning entry will be made and stocking reduced to 320 trees per acre. These increased densities will provide the thermal cover needed by wintering deer herds.

The first commercial thin entry will be made when stands grow to 8-9 inches d.b.h. leaving 200 trees per acre. Three more intermediate harvest entries will be made at 20-year intervals leaving stocking somewhat higher than recommended levels. At age 140, the regeneration entry will start the cycle over.

This management system on winter ranges will result in a total useable wood production of approximately 80 percent of standard.

Forage on winter deer ranges is essential to the survival of deer herds. It should be interspersed with thermal cover stands and will be the dedicated management direction on forty percent of the winter deer range. A forage area is defined as openings or (open-grown timber stands) either natural or man-made or forested areas not meeting thermal cover criteria and at least 200 feet square. In managed stands spacing should be wide enough to promote the production of browse species.

PONDEROSA PINE - LONE PINE WINTER RANGE - FORAGE

S.I. 73    KBWC    TSB  
11-2

| <u>Age</u> | <u>Height</u> | <u>Diam.</u> | <u>Trees/Acre</u> |              | <u>Basal Area/Acre</u> |              | <u>Silvicultural Treatment</u> |
|------------|---------------|--------------|-------------------|--------------|------------------------|--------------|--------------------------------|
|            |               |              | <u>All</u>        | <u>Leave</u> | <u>All</u>             | <u>Leave</u> |                                |
| 15         | 18            | 2            | 500               | 100          | 11                     | 5            | Precommercially Thin           |
| 35         | 36            | 10           | 90                | 90           | 51                     | 51           | No treatment                   |
| 55         | 52            | 15           | 90                | 90           | 110                    | 110          | No treatment                   |
| 75         | 65            | 18           | 90                | 57           | 157                    | 100          | Commercial thin                |
| 95         | 75            | 21           | 57                | 57           | 132                    | 132          | No treatment                   |
| 115        | 84            | 23           | 56                | 56           | 163                    | 163          | No treatment                   |
| 135        | 92            | 26           | 56                | 18           | 199                    | 64           | Regeneration Shelterwood       |
| 155        | 95            | 28           | 18                | 0            | 75                     | 0            | Final Removal                  |

PONDEROSA PINE - LONE PINE WINTER DEER RANGE

S.I. 73      THERMAL COVER

| <u>Age</u> | <u>Height</u> | <u>Diam.</u> | TSB<br>W-3A<br><u>Trees/Acre</u> |              | <u>Basal Area/Acre</u> |              | <u>Silvicultural<br/>Treatment</u> |
|------------|---------------|--------------|----------------------------------|--------------|------------------------|--------------|------------------------------------|
|            |               |              | <u>All</u>                       | <u>Leave</u> | <u>All</u>             | <u>Leave</u> |                                    |
| 35         | 24            | 4            | 600                              | 320          | 52                     | 34           | Precommercial<br>Thinning          |
| 60         | 36            | 8            | 300                              | 205          | 110                    | 73           | Commercial<br>Thinning             |
| 80         | 52            | 11           | 200                              | 133          | 134                    | 90           | Commercial<br>Thinning             |
| 100        | 64            | 14           | 130                              | 78           | 143                    | 87           | Commercial<br>Thinning             |
| 120        | 73            | 17           | 77                               | 61           | 121                    | 96           | Commercial<br>Thinning             |
| 140        | 83            | 19           | 60                               | 20           | 124                    | 42           | Shelterwood<br>Harvest             |
| 160        | 89            | 21           | 20                               | 0            | 48                     | 0            | Final Removal                      |

## APPENDIX B: CURRENT MGT. PRESCRIPTION- DEER SUMMER RANGE

WINEMA NF - On summer range, it is quite important to achieve a mosaic of habitat components, i.e. forage and cover, which expresses adequate dispersion and balance. Since the production of palatable forage is essential to growing deer which are in good physical condition when they go the wintering areas, it is important that the forage component be given proper attention. Sixty percent of the summer range area will be managed in such a way as to provide foraging areas. The remaining forty percent of the area will be managed to provide hiding and thermal cover.

A wide variety of stand conditions exist presently. There are three main species or species groups which we will describe in terms of general timber management prescription, ponderosa pine, lodgepole pine, and pine-associated stands.

Ponderosa Pine - This species will be managed on summer range on a 135-year rotation. When stands reach 135 years in age, they will be regenerated using either the shelterwood or clear-cut method. New stands of trees will be established at a density of about 450-600 trees per acre. At age 15 these stands will be pre-commercially thinned to a stocking level of 250 trees per acre. At stand ages 35, 55, 75, and 95 these stands will be treated with commercial thinning with corresponding tree densities of 144, 104, 77, and 60 trees per acre. This stocking level will be carried to age 135 when the cycle will be started with a regeneration harvest treatment.

Pine-associated - This species group will be managed on summer range on a 130-year rotation. When stands reach 130 years in age, they will be regenerated using the shelterwood or clear-cut method. Regenerated stands will be established at seedling densities of 450-600 trees per acre. At age 20 these stands will be treated with a pre-commercial thinning which will reduce the tree stocking to about 325 trees per acre. At ages 50, 70, and 90 the stands will be commercially thinned to corresponding densities of 205, 140, and 96 trees per acre. This stocking level will be carried to stand age 130 when a regeneration harvest treatment will be implemented and the cycle started over again.

lodgepole pine - This species will be managed on an 80-year rotation on deer summer range. On stands which reach rotation age a regeneration harvest treatment will be implemented using the clear-cut method. New stands of trees will be established at a density of 400-600 trees per acre. At age 15 the stands will be precommercially thinned to a stocking level of 300 trees per acre. Commercial thinning treatments will be carried out at ages 40 and 60 to corresponding densities of 165 and 98 trees per acre. At age 80 the cycle will be started again by applying a regeneration harvest.

In all the species groups cover will be provided by stands which are around 50 years of age and younger. Foraging areas will exist in stands which exceed 50 years in age.

TABLE 1: SPECIES AND SPECIES GROUP PRESCRIPTIONS

## PONDEROSA PINE

| AGE | HT | DIAM | ALL TR | LEAVE TR | SILV. PRESC. |
|-----|----|------|--------|----------|--------------|
| 15  | 18 | 2    | 4-600  | 250      | SPC          |
| 35  | 36 | 9    | 235    | 144      | HTH          |
| 55  | 52 | 12   | 141    | 104      | HTH          |
| 75  | 65 | 15   | 102    | 77       | HTH          |
| 95  | 75 | 17   | 76     | 60       | HTH          |
| 135 | 92 | 22   | 60     | 0        | HRG          |

## PINE-ASSOCIATED

| AGE | HT | DIAM | ALL TR | LEAVE TR | SILV. PRESC. |
|-----|----|------|--------|----------|--------------|
| 20  | 17 | 2    | 4-600  | 325      | SPC          |
| 50  | 51 | 9    | 300    | 205      | HTH          |
| 70  | 70 | 12   | 200    | 110      | HTH          |
| 90  | 79 | 14   | 139    | 96       | HTH          |
| 130 | 92 | 20   | 94     | 0        | HRG          |

## LODGEPOLE PINE

| AGE | HT | DIAM | ALL TR | LEAVE TR | SILV. PRESC. |
|-----|----|------|--------|----------|--------------|
| 15  | 15 | 2    | 4-600  | 300      | SPC          |
| 40  | 37 | 8    | 285    | 165      | HTH          |
| 60  | 52 | 11   | 153    | 984      | HTH          |
| 80  | 65 | 14   | 942    | 0        | HRG          |



## APPENDIX C: CURRENT HABITAT SITUATION

The mule deer is the most commonly sought-after game animal inhabiting the area under consideration. The ODFW has divided the area into 10 management units, primarily for the regulation of mule deer harvest. Portions of four of these units, Fort Rock, Silver Lake, and Sprague are found within the extended boundaries of the former reservation. Most of the area is summer range for deer. About 25000 acres of the Winema are classified as deer winter range. Most of the deer which spend the summer on the area move off to other areas for the winter. These wintering areas are approximately fifty percent privately-owned lands. The area primarily identified as deer winter range is in the Lone Pine area of the lower Sprague River valley on the Chiloquin Ranger District of the Winema NF.

The National Forest portion of these wintering areas consist of pockets of commercial timber in various successional stages, brushfields, mountain-mahogany and juniper thickets, moist and dry meadows, scabrock flats, and rimrocks. Elevations range from approximately 4400-5200 feet. There are vehicle travel routes through portions of the area and all of it has easy access for all-terrain vehicles. These vehicles may be having some effect on the area's ability to provide adequate security for wintering animals.

The criteria used to delineate mule deer winter ranges on the area were primarily:

1. Season of Use: In a majority of the years deer are concentrated on these areas from Nov. 15 to Apr. 15.
2. Number of Animals: At least 80 percent of the animals occupy these areas in an average year. This includes the private and other agency lands in and adjacent to the National Forest boundaries.
3. Snow Depth: In average years snow depth is seldom greater than 12 inches, except for brief periods (one to two week intervals of the five-months).
4. Elevation: The areas occupied by deer during this period, on an average, are below the 5200-foot contour line.

Although the above criteria helped identify a significant majority of the winter ranges, not all the winter ranges exactly meet these criteria. Slope, aspect, extent and type of vegetation or individual herd characteristics are some of the other factors influencing the occurrence of deer winter range.

The areas immediately adjacent to winter range often receive significant use by deer in both spring and fall during migrations to and from winter range. In mild weather years, these areas may function as winter range. There are no estimates of the acreages of transitory range, because of its variability. All of the area under consideration which is outside the winter range is designated as deer summer range.

One of the most limiting factors to deer abundance and use, other than weather, is the availability of cover. Three types of cover are recognized; fawning, thermal, and hiding. Hiding and thermal cover occur on both winter and summer range, while fawning cover is found on summer range.

Good quality summer range puts deer in good condition to survive the critical winter period. Deer carry much of their winter range food requirements with them off the summer range in the form of fat and protein. Winter range food resources on the Forests are generally limited in quantity and quality. For this reason thermal cover on winter range is of critical importance. On summer range, adequate amounts of cover are required so ; that the available forage can be utilized.

In general, on the area being considered, there is a reasonably acceptable distribution of both cover and forage on summer range. The existing supply of forage may be less than optimum in terms of palatability due to the fact that many of the stands of bitterbrush are 50-70 years old. There are many decadent plants in stands of this age which tend to lower the nutritional value of these plants as well. Also in a general way due to the age and structure of many of the timber stands on the area, there is more cover present than is optimally required on summer range. This fact also tends to have a limiting effect on forage production. Forage diversity is also somewhat restricted. There are fewer palatable grasses and forbs than optimum due to the large acreages which support an overtopping canopy of tree species.

Water is relatively well distributed over the area. There a few local situations which could be described as lacking in water, but they are not large enough or numerous enough to lower the total area's ability to support deer.

## APPENDIX D

Vegetation Type Ratings - Cover, Forage

Potential Ratings - Cover, Forage

Deer Habitat Tables - All Variables

DOMINANT VEGETATION AND UNDERSTORY VEGETATION RATING FOR FORAGE

| <u>Rating</u> | <u>Code</u> | <u>Vegetation</u>                                       |
|---------------|-------------|---------------------------------------------------------|
| 1.0           | SX          | Mountain Mahogany                                       |
|               | HA          | Aspen                                                   |
|               | ST          | Bitterbrush                                             |
|               | WM          | Moist Meadow                                            |
|               | GH          | Annual grasses and forbs                                |
|               | GF          | Perennial Forbs                                         |
|               | CV          | Ceanothus                                               |
|               | CVF         | Ceanothus Brushfield                                    |
|               | LX1         | LPP, young, wet, 10-40 years                            |
|               | LX3         | LPP, old, wet, 40+ years                                |
| .9            | GL          | Dry Meadows, bunchgrass, seedings                       |
| .8            | KXP         | Juniper 10-40 TPA                                       |
| .7            | P4P         | PP large sawtimber, HRG, less than 39% cr. cl.          |
| .6            | P3P         | PP small sawtimber, HRG, less than 39% cr. cl.          |
|               | KXM         | Juniper, 40-70 TPA                                      |
|               | SV          | Serviceberry                                            |
|               | LX4         | LPP, young, dry, 10-40 years old                        |
|               | PAC         | Plantations 4.5' tall to 15 years old                   |
| .5            | SB          | Big sage, Big sage-grass                                |
|               | M2X         | All conifer stands w/ HTH silv. models                  |
| .4            | KXG         | Juniper, 70+ TPA                                        |
|               | M1X         | All conifer stands w/ SPC silv. models                  |
|               | M3P         | Pine-assoc. small sawtimber, HRG, less than 40% cr. cl. |
|               | M4P         | Pine-assoc. large sawtimber, HRG, less than 40% cr. cl. |
|               | SN          | Snowberry                                               |
|               | HB          | Huckleberry-blueberry                                   |
|               | CT          | Currant                                                 |
|               | SR          | Green Rabbitbrush                                       |
|               | LX2         | LPP, old, dry, 40+ years old                            |
| .3            | MZ          | Manzanita                                               |
|               | MZF         | Manzanita Brushfield                                    |
|               | SL          | Low sagebrush                                           |
|               | P3M         | PP sawtimber, HRG, 40-60% cr.cl.                        |
|               | W3P         | White-fir small sawtimber, HRG, less than 39% cr. cl.   |
|               | W4P         | White-fir large sawtimber, HRG, less than 39% cr.cl.    |
|               | PLP         | Plantations with saplings 1.5-4.5' tall                 |
|               | P3G         | PP sawtimber, HRG, 40% cr. cl.                          |
| .2            | WW          | Wet Meadows                                             |
|               | M3G         | Pine-assoc. small sawtimber, HRG, 40%+ cr. cl.          |
|               | M4G         | Pine-assoc. large sawtimber, HRG, 40%+ cr.cl.           |
|               | P6G         | PP two-storied, HFR                                     |
|               | UX          | Plantations with seedling less than 1.5' tall*          |
| .1            | BB          | Bearberry                                               |
|               | W3G         | WF small sawtimber, HRG, 40%+ cr. cl.                   |
|               | W4G         | WF large sawtimber, HRG, 40%+ cr. cl.                   |
|               | M6G         | Pine-assoc., two-storied, HFR                           |
|               | W6G         | WF two-storied, HFR                                     |
|               | RY          | Gray Rabbitbrush                                        |
| 0             | NB          | Barren-rocks                                            |
|               | NW          | Water                                                   |

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

\* To be used for first-year plantations

## DOMINANT VEGETATION &amp; UNDERSTORY VEGETATION RATINGS FOR COVER

|     |     |                                                 |
|-----|-----|-------------------------------------------------|
| 1.0 | KXG | Juniper, 70+ TPA                                |
|     | M6G | Pine-assoc. stands-two storied-HFR              |
|     | W6G | White-fir stands, two-storied, HFR              |
|     | P6G | PP two-storied, HFR                             |
|     | W3G | Pine-assoc., small sawtimber 70% cr. cl. HRG    |
|     | P3G | PP sawtimber 70% cr. cl. HRG                    |
|     | SX  | Mountain Mahogany                               |
|     | PAC | Plantations 4.5' tall to 15 years of age        |
| .9  | LX1 | LPP, young, wet, 10-40 years old                |
|     | LX4 | LPP, young, dry, 10-40 years old                |
| .8  | CVF | Ceanothus brushfield                            |
|     | LX3 | LPP, old, wet, 40+ years                        |
| .7  | MZF | Manzanita brushfield                            |
| .6  | CV  | Ceanothus                                       |
|     | LX2 | LPP, old, dry, 40+ years                        |
|     | M1X | All conifer stands w/ SPC silv. models          |
|     | M2X | All conifer stands w/ HTH silv. models          |
|     | W3P | WF small sawtimber 40-70% cr. cl., HRG          |
|     | W4P | WF large sawtimber 40-70% cr. cl., HRG          |
| .5  | HA  | Aspen                                           |
|     | M4G | Pine-assoc. large sawtimber 40% cr. cl. HRG     |
|     | M3G | Pine-assoc. small sawtimber 40% cr. cl. HRG     |
|     | W4G | WF large sawtimber, 40%+ cr.cl. HRG             |
|     | KXM | Juniper, 40-70 TPA                              |
|     | M4P | Pine-assoc. large sawtimber, 40-70% cr. cl.     |
|     | M3P | Pine-assoc. small sawtimber, 40-70% cr. cl. HRG |
|     | P4P | PP small sawtimber less than 40% cr. cl. HRG    |
| .4  | P3M | PP small sawtimber 40-70% cr. cl. HRG           |
|     | MZ  | Manzanita                                       |
|     | ST  | Bitterbrush                                     |
| .3  | KXP | Juniper 10-40 TPA                               |
|     | SB  | Big sagebrush                                   |
|     | PLP | Plantations w/ seedlings 1.5-4.5' tall          |
| .2  | WM  | Moist meadows                                   |
|     | WW  | Wet meadows                                     |
|     | SR  | Green Rabbitbrush                               |
|     | RY  | Gray Rabbitbrush                                |
| .1  | UX  | Plantations w/ seedlings less than 1.5' tall    |
|     | SL  | Low sagebrush                                   |
|     | CT  | Currant                                         |
|     | GL  | Dry meadows, bunchgrass, seedings               |
|     | GH  | Weeds and annual grasses                        |
|     | GF  | Perennial forbs                                 |
|     | BB  | Bearberry                                       |
|     | SN  | Snowberry                                       |
|     | HB  | Huckleberry, blueberry                          |
| 0   | NB  | Barren-rocks                                    |
|     | NW  | Water                                           |

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

PLANT COMMUNITY PRODUCTIVITY POTENTIAL FORAGE RATING

Basis: Highest rated (forage) dominant or understory vegetation type predicted for each community.

|     |    |          |                                            |
|-----|----|----------|--------------------------------------------|
| 1.0 | 45 | MM-90    | Moist meadow                               |
|     | 12 | CL-M3-11 | LPP, blueberry forb wetland                |
|     | 13 | CL-M1-11 | LPP, sedge, grass, wetland                 |
|     | 70 | CW-H2-11 | WF, PP, Aspen, long stolon sedge           |
|     | 37 | CP-S1-11 | PP, Putr, sagebrush, fescue                |
|     | 61 | CP-C2-11 | PP, Juniper, mahog, Putr, big sage, fescue |
|     | 62 | CP-H3-11 | PP, Aspen, bluegrass                       |
|     | 38 | CJ-S3-11 | Juniper, Putr, bunchgrass                  |
|     | 46 | MD-19-11 | Dry meadow                                 |
|     | 50 | MD-31-11 | Bluegrass dry meadow                       |
|     | 59 | CL-H1-11 | LPP, Aspen, strawberry                     |
| .9  | 26 | CP-S2-17 | PP, Putr, Manzanita, fescue                |
| .8  | 04 | CW-S1-12 | Mx-con, snowbrush, manzanita               |
|     | 07 | CP-S3-12 | PP, Putr, snowbrush, sedge                 |
|     | 36 | CP-S2-16 | PP, Putr, bunchgrass                       |
|     | 25 | CP-S2-11 | PP, Putr, fescue                           |
|     | 30 | CP-S3-11 | PP, Putr, snowbrush, manzanita             |
|     | 32 | CP-S2-14 | PP, Putr, manzanita, sedge                 |
|     | 63 | CP-S1-21 | PP, mtn big sage, bluegrass                |
|     | 39 | SD-29-13 | Big sage, Putr, bunchgrass                 |
|     | 14 | CL-S9-11 | LPP, snowbrush, manzanita                  |
| .7  | 65 | CW-S3-13 | WF, PP, snowberry, starwort                |
|     | 66 | CW-S1-17 | WF, PP, manzanita, Ore. grape              |
|     | 27 | CP-F1-11 | PP, wooly wyethia                          |
|     | 28 | CP-S2-12 | PP, Putr, needlegrass                      |
|     | 29 | CP-S2-13 | PP, Putr, manzanita, needlegrass           |
|     | 31 | CP-S2-15 | PP, Putr, sedge                            |
|     | 40 | SD-29-12 | Big sage, bunchgrass                       |
|     | 15 | CL-S2-14 | LPP, Putr, fescue                          |
|     | 33 | CL-S2-13 | LPP, Putr, forbs                           |
| .6  | 09 | CW-S1-16 | Mx-con, snowbrush, sq. cpt., strawberry    |
|     | 05 | CW-S1-15 | Mx-con, snowbrush, sedge                   |
|     | 10 | CW-S3-12 | WF, snowberry, strawberry                  |
|     | 41 | SD-33-11 | Putr, needlegrass, sedge                   |
| .5  | 06 | CW-S1-14 | Mx-con, snowbrush                          |
|     | 02 | CW-H1-11 | Mx-con, snowbrush, chinkapin               |
|     | 67 | CW-C4-12 | WF, PP, Sug P, manzanita                   |
|     | 53 | CJ-S1-12 | Juniper, low sage, fescue                  |
|     | 42 | SD-19-13 | Low sage, fescue, squirreltail             |
| .4  | 68 | CW-C1-11 | WF, PP, IC, serviceberry                   |
|     | 52 | SD-92-12 | Low sage, bluegrass, onespike oatgrass     |
|     | 17 | CL-S2-12 | LPP, Putr, sedge                           |
|     | 19 | CL-S2-15 | LPP, currant, Putr, needlegrass            |

|    |    |           |                                         |
|----|----|-----------|-----------------------------------------|
| .3 | 69 | CW-C4-11  | WF, PP, WWP, sticky currant             |
|    | 43 | SD-19-12  | Low sage, fescue                        |
|    | 18 | CL-S2-11  | LPP, Putr, needlegrass                  |
|    | 11 | CL-M2-11  | LPP, bearberry                          |
|    | 20 | CL-G4-11  | LPP, sedge, lupine                      |
|    | 22 | CL-G3-13  | LPP, needlegrass, linanthostrum         |
| .2 | 44 | MW        | Wet meadow                              |
|    | 64 | CW-C3-11  | WF, LPP, long stolon sedge, needlegrass |
|    | 51 | MW-19-11  | Sedge wet meadow                        |
|    | 49 | SD-92-11  | Low sage, goldenweed, bluegrass         |
|    | 54 | SS-49-21  | Alpine low sage, red fescue             |
|    | 01 | CM-S1-11  | Mtn Hemlock, grouse huckleberry         |
|    | 23 | CL-S3-11  | LPP, manzanita                          |
|    | 57 | CL-G3-15  | LPP, strawberry, fescue                 |
|    | 58 | CL-G4-15  | LPP, squirreltail, long stolon sedge    |
| .1 | 24 | CL-S4-12  | LPP, grouse huckleberry                 |
|    | 03 | CR-S1-11  | Mx-con, manzanita                       |
|    | 34 | GB-99     | Bluegrass scabland                      |
|    | 16 | CL-G3-11  | LPP, needlegrass basins                 |
|    | 35 | CL-G4-13  | LPP, sedge, needlegrass basins          |
|    | 55 | CL-C1-11  | LPP, Wh Bk P, gay penstemon             |
|    | 56 | CL-C1-12  | LPP, Wh Bk P, WWP, sandwort             |
| 0  | 08 | CL-F1-11  | LPP, forb                               |
|    | 21 | CL--G3-14 | LPP, needlegrass, lupine                |
|    | 47 | NB        | Barren-rocks                            |
|    | 48 | NW        | Water                                   |

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

PLANT COMMUNITY PRODUCTIVITY POTENTIAL COVER RATING

Basis: Highest rated (cover) dominant or understory vegetation type predicted for each community.

|     |    |          |                                            |
|-----|----|----------|--------------------------------------------|
| 1.0 | 02 | CW-H1-11 | Mx-con, snowbrush, chinkapin               |
|     | 03 | CR-S1-11 | Mx-con, manzanita                          |
|     | 04 | CW-S1-12 | Mx-con, snowbrush, manzanita               |
|     | 05 | CW-S1-15 | Mx-con, snowbrush, sedge                   |
|     | 06 | CW-S1-14 | Mx-con, snowbrush                          |
|     | 07 | CP-S3-12 | PP, Putr, snowbrush, sedge                 |
|     | 08 | CL-F1-11 | LPP, forb                                  |
|     | 09 | CW-S1-16 | Mx-con, snowbrush, sq. carpet, strawberry  |
|     | 10 | CW-S3-12 | WF, snowberry, strawberry                  |
|     | 64 | CW-C3-11 | WF, LPP, long stolon sedge, needlegrass    |
|     | 65 | CW-S3-13 | WF, PP, snowberry, starwort                |
|     | 66 | CW-S1-17 | WF, PP, manzanita, Ore. grape              |
|     | 67 | CW-C4-12 | WF, PP, Sug P, manzanita                   |
|     | 68 | CW-C1-11 | WF, PP, IC, serviceberry                   |
|     | 69 | CW-C4-11 | WF, PP, WWP, sticky currant                |
|     | 70 | CW-H2-11 | WF, PP, Aspen, long stolon sedge           |
|     | 11 | CL-M2-11 | LPP, bearberry                             |
|     | 12 | CL-M3-11 | LPP, blueberry wetland                     |
|     | 13 | CL-M1-11 | LPP, sedge, grass wetland                  |
|     | 14 | CL-S9-11 | LPP, snowbrush, manzanita                  |
|     | 15 | CL-S2-14 | LPP, bitterbrush, fescue                   |
|     | 17 | CL-S2-12 | LPP, bitterbrush, sedge                    |
|     | 18 | CL-S2-11 | LPP, bitterbrush, needlegrass              |
|     | 19 | CL-S2-15 | LPP, currant, Putr, needlegrass            |
|     | 20 | CL-G4-11 | LPP, sedge, lupine                         |
|     | 21 | CL-G3-14 | LPP, needlegrass, lupine                   |
|     | 22 | CL-G3-13 | LPP, needlegrass, lupine, linanthostrum    |
|     | 24 | CL-S4-12 | LPP, grouse huckleberry                    |
|     | 56 | CL-C1-12 | LPP, Wh Bk P, WWP, sandwort                |
|     | 57 | CL-G3-15 | LPP, strawberry, fescue                    |
|     | 59 | CL-H1-11 | LPP, Aspen, strawberry                     |
|     | 25 | CP-S2-11 | PP, Putr, fescue                           |
|     | 26 | CP-S2-17 | PP, Putr, manzanita, fescue                |
|     | 27 | CP-F1-11 | PP, wooly wyethia                          |
|     | 28 | CP-S2-12 | PP, Putr, needlegrass                      |
|     | 29 | CP-S2-13 | PP, Putr, manzanita, needlegrass           |
|     | 30 | CP-S3-11 | PP, Putr, snowbrush, needlegrass           |
|     | 31 | CP-S2-15 | PP, Putr, sedge                            |
|     | 61 | CP-C2-11 | PP, Juniper, mahog, Putr, big sage, fescue |
|     | 62 | CP-H3-11 | PP, Aspen, bluegrass                       |
|     | 63 | CP-S1-21 | PP, mtn. big sage, bluegrass               |
|     | 33 | CL-S2-13 | LPP, Putr, forb                            |
| .9  | 55 | CL-C1-11 | LPP, Wh Bk P, gay penstemon                |
|     | 32 | CP-S2-14 | PP, Putr, manzanita, sedge                 |
|     | 58 | CL-G4-15 | LPP, squirreltail, long stolon sedge       |
|     | 60 | CL-S1-12 | LPP, sagebrush                             |
|     | 36 | CP-S2-16 | PP, Putr, bunchgrass                       |
|     | 37 | CP-S1-11 | PP, Putr, sagebrush, fescue                |



|    |    |          |                                         |
|----|----|----------|-----------------------------------------|
| .7 | 16 | CL-G3-11 | LPP, needlegrass basins                 |
| .6 | 01 | CM-S1-11 | Mtn Hemlock, grouse huckleberry         |
|    | 23 | CL-S3-11 | LPP, manzanita                          |
|    | 35 | CL-G4-13 | LPP, sedge, needlegrass basin           |
| .5 | 38 | CJ-53-11 | Juniper, Putr, bunchgrass               |
| .3 | 39 | SD-29-13 | Big sage, Putr, bunchgrass              |
|    | 40 | SD-29-12 | Big sage, bunchgrass                    |
| .2 | 53 | CJ-S1-12 | Juniper, low sage, fescue               |
|    | 41 | SD-33-11 | Bitterbrush, needlegrass, sedge         |
|    | 44 | MW       | Wet meadow                              |
|    | 45 | MM-90    | Moist meadow                            |
|    | 51 | MW-19-11 | Sedge wet meadow                        |
| .1 | 34 | GB-99    | Bluegrass scabland                      |
|    | 42 | SD-19-13 | Low sage, fescue, squirreltail          |
|    | 43 | SD-19-12 | Low sage, fescue                        |
|    | 52 | SD-92-12 | Low sage, bluegrass, one-spike oatgrass |
|    | 46 | MD-19-11 | Dry meadow                              |
|    | 49 | SD-92-11 | Low sage, goldenweed, bluegrass         |
|    | 50 | MD-31-11 | Bluegrass dry meadow                    |
|    | 54 | SS-49-21 | Alpine low sage, red fescue             |
| 0  | 47 | NB       | Barren-rocks                            |
|    | 48 | NW       | Water                                   |

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

SHRUB AGE RATINGS FOR FORAGE AND (COVER)

| <u>SHRUB</u>           | <u>AGE-CLASS</u> |              |               |                 |
|------------------------|------------------|--------------|---------------|-----------------|
|                        | <u>SEEDLING</u>  | <u>YOUNG</u> | <u>MATURE</u> | <u>DECADENT</u> |
| Bearberry              | .1(0)            | 0(0)         | 0(0)          | 0(0)            |
| Green Rabbitbrush      | .3(0)            | .6(.1)       | 1.0(.4)       | .3(.3)          |
| Bitterbrush            | .1(0)            | .4(.2)       | 1.0(.6)       | .4(.5)          |
| Ceanothus              | .7(.1)           | 1.0(.4)      | .5(.8)        | .3(1.0)         |
| Mahogany               | .1(0)            | 1.0(.3)      | .8(1.0)       | .3(.9)          |
| Big Sagebrush          | .3(.1)           | 1.0(.2)      | .6(.6)        | .4(.5)          |
| Manzanita              | .5(.1)           | 1.0(.3)      | .3(.7)        | .1(1.0)         |
| Currant                | .7(.1)           | 1.0(.2)      | .6(.4)        | .2(.3)          |
| Blueberry, Huckleberry | .5(0)            | 1.0(.1)      | .5(.2)        | .3(.2)          |
| Snowberry (creeping)   | 1.0(0)           | .7(0)        | .5(0)         | .1(0)           |
| Serviceberry           | .5(0)            | 1.0(.1)      | .7(.2)        | .1(.2)          |
| Low sagebrush          | .1(0)            | 1.0(0)       | .8(.1)        | .2(.1)          |

Rated by: Craig Bienz, Jack Inman, Ralph Opp, Gene Silovsky

These ratings are intended for general situations. If a specific area being evaluated is significantly different, values which reflect that specific set of conditions should be used.

AFI/PAFI MODIFIERS FOR DISTANCE BETWEEN WATER SOURCES

| <u>GENERAL</u>       |                 |
|----------------------|-----------------|
| <u>Distance(mi.)</u> | <u>Modifier</u> |
| 0                    | 1.0             |
| 1                    | 1.0             |
| 2                    | 1.0             |
| 3                    | 1.0             |
| 4                    | .7              |
| 5                    | .4              |
| 6                    | .2              |

Rated by: Gene Silovsky, Jack Inman, Craig Bienz, Ralph Opp

## AFI MODIFIER FOR COVER:FORAGE RATIO

| <u>SUMMER RANGE</u> |                 | <u>WINTER RANGE</u> |                 |
|---------------------|-----------------|---------------------|-----------------|
| <u>C:F</u>          | <u>Modifier</u> | <u>C:F</u>          | <u>Modifier</u> |
| 10/90               | .2              | 10/90               | .1              |
| 20/80               | .4              | 20/80               | .3              |
| 30/70               | .9              | 30/70               | .7              |
| 40/60               | 1.0             | 40/60               | 1.0             |
| 50/50               | 1.0             | 50/50               | 1.0             |
| 60/40               | .9              | 60/40               | 1.0             |
| 70/30               | .7              | 70/30               | .9              |
| 80/20               | .6              | 80/20               | .8              |
| 90/10               | .5              | 90/10               | .7              |
|                     |                 | 100/0               | .6              |

Rated by: Ralph Opp, Gene Silovsky, Jack Inman, Craig Bienz, Bill Pieratt

The C:F Ratio modifier is an adjustment for quality. C:F ratios outside the optimum range will result in a discounting due to quality which is less than optimum.

## AFI MODIFIER FOR LEVEL OF LIVESTOCK GRAZING USE

Percentages are percent of total production available for all grazing use after fifty percent of the current year's production has been allocated for plant reserves.

| <u>Summer Range And</u> |                               | <u>Heavy Use</u>              |                 |
|-------------------------|-------------------------------|-------------------------------|-----------------|
| <u>Light Use</u>        | <u>Winter Range (by deer)</u> | <u>Winter Range (by deer)</u> |                 |
| <u>% Livestock Use</u>  | <u>Modifier</u>               | <u>% Livestock Use</u>        | <u>Modifier</u> |
| 0                       | .9                            | 0                             | 1.0             |
| 10                      | 1.0                           | 10                            | .9              |
| 20                      | 1.0                           | 20                            | .8              |
| 30                      | .9                            | 30                            | .7              |
| 40                      | .8                            | 40                            | .6              |
| 50                      | .6                            | 50                            | .5              |
| 60                      | .5                            | 60                            | .4              |
| 70                      | .4                            | 70                            | .3              |
| 80                      | .3                            | 80                            | .2              |
| 90                      | .2                            | 90                            | .1              |
| 100                     | 0                             | 100                           | 0               |

Rated by: Ralph Opp, Craig Bienz, Jack Inman, Gene Silovsky, Bill Pieratt

\*That portion of annual production allocated for plant reserves (50%) is actually available to deer. If this forage is taken by deer, a long term decrease in carrying capacity will result due to decreasing health and vigor of plants.

## AFI/PAFI MODIFIER FOR ROAD DENSITY

| <u>SUMMER RANGE</u> |                  | <u>WINTER RANGE</u> |                  |
|---------------------|------------------|---------------------|------------------|
| <u>Roads</u>        | <u>(mi/sec.)</u> | <u>Roads</u>        | <u>(mi/sec.)</u> |
| 0                   | 1.0              | 0                   | 1.0              |
| 1                   | .9               | 1                   | .7               |
| 2                   | .9               | 2                   | .5               |
| 3                   | .8               | 3                   | .4               |
| 4                   | .6               | 4                   | .2               |
| 5                   | .5               |                     |                  |
| 6                   | .3               |                     |                  |

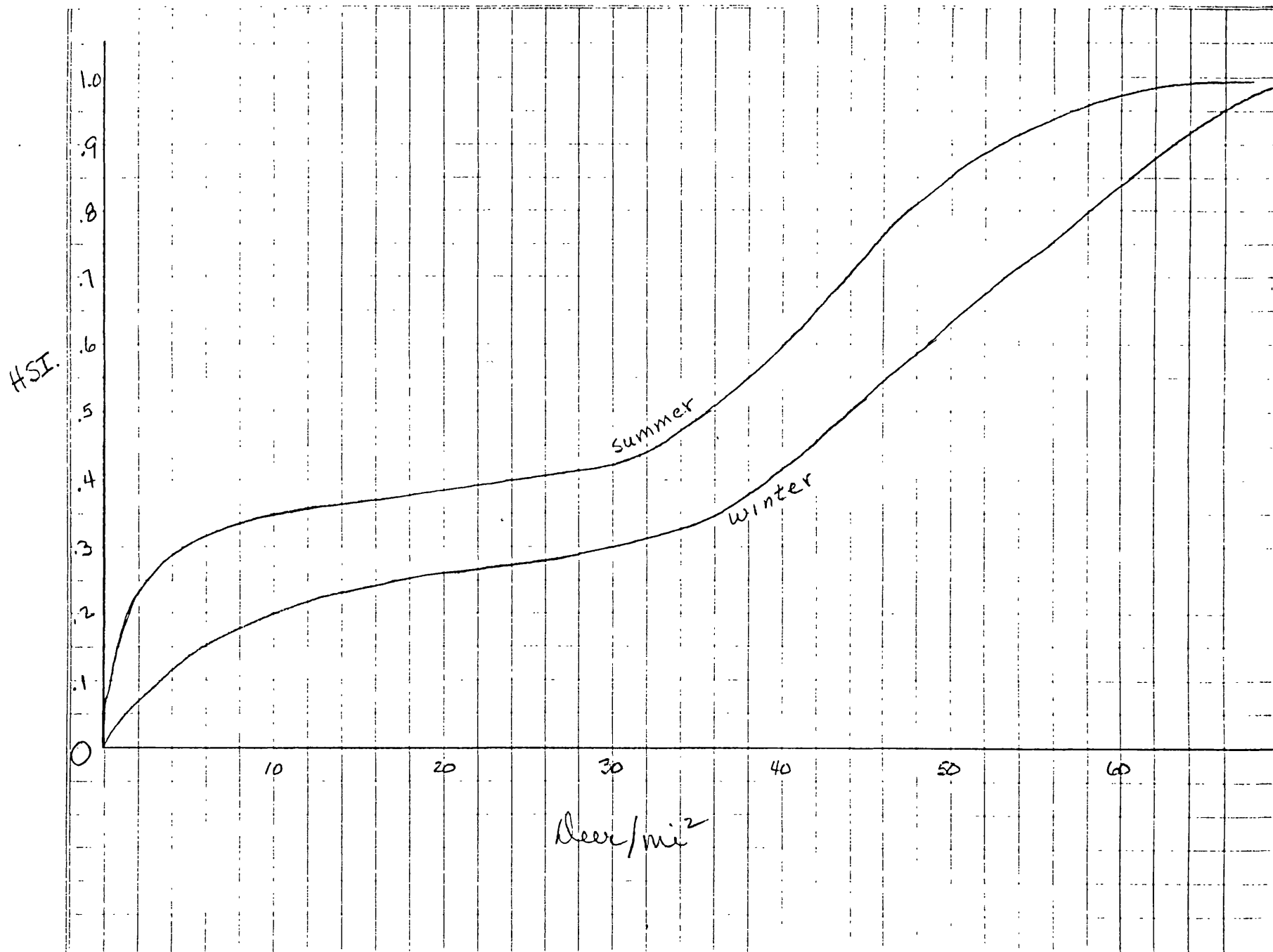
Rated by: Gene Silovsky, Ralph Opp, Craig Bienz, Jack Inman

## AFI/PAFI MODIFIER FOR AREA COVER INDEX (ACI)

| <u>Area Cover Index</u> | <u>Modifier</u> |
|-------------------------|-----------------|
| 0                       | .4              |
| .1                      | .6              |
| .2                      | .8              |
| .3                      | .9              |
| .4                      | 1.0             |
| .5                      | 1.0             |
| .6                      | 1.0             |
| .7                      | 1.0             |
| .8                      | 1.0             |
| .9                      | 1.0             |
| 1.0                     | 1.0             |

Rated by: Jack Inman, Bill Pieratt

The ACI modifier for AFI/PAFI is an adjustment for quantity. As long as the minimum of .4 (ACI) is present, there is no AFI discount for quantity.



## ALPHABETIC LISTING OF DOMINANT AND UNDERSTORY VEGETATION

| <u>Code</u> | <u>Vegetation</u>                                       |
|-------------|---------------------------------------------------------|
| M2X         | All conifer stands w/ HTH silv. models                  |
| M1X         | All conifer stands w/ SPC silv. models                  |
| HA          | Aspen                                                   |
| NB          | Barraen-rocks                                           |
| BB          | Bearberry                                               |
| SB          | Big sage, Big sage-grass                                |
| ST          | Bitterbrush                                             |
| CV          | Ceanothus                                               |
| CVF         | Ceanothus Brushfield                                    |
| CT          | Currant                                                 |
| GL          | Dry Meadows, bunchgrass, seedlings                      |
| RY          | Gray Rabbitbrush                                        |
| SR          | Green rabbitbrush                                       |
| HB          | Huckleberry-blueberry                                   |
| KXP         | Juniper 10-40 TPA                                       |
| KXM         | Juniper, 40-70 TPA                                      |
| KXG         | Juniper, 70+ TPA                                        |
| SL          | Low sagebrush                                           |
| LX2         | LPP, old, dry, 40+ years old                            |
| LX3         | LPP, old, wet, 40+ years                                |
| LX4         | LPP, Young, dry, 10-40 years old                        |
| LX1         | LPP, Young, wet, 10-40 years                            |
| MZ          | Manzanita                                               |
| MZF         | Manzanita Brushfield                                    |
| WM          | Moist Meadow                                            |
| SX          | Mountain Mahogany                                       |
| GF          | Perennial Forbs                                         |
| M4P         | Pine-assoc. large sawtimber, HRG, less than 40% cr. cl. |
| M4G         | Pine-assoc. large sawtimber, HRG, 40%+ cr.cl.           |
| M3P         | Pine-assoc. small sawtimber, HRG, less than 40% cr. cl. |
| M3G         | Pine-assoc. small sawtimber, HRG, 40%+ cr. cl.          |
| M6G         | Pine-assoc., two-storied, HFR                           |
| UX          | Plantations w/ seedlings less than 1.5' tall            |
| PLP         | Plantations with saplings 1.5-4.5' tall                 |
| PAC         | Plantations 4.5' tall to 15 years old                   |
| P4P         | PP large sawtimber, HRG, less than 39% cr. cl.          |
| P3M         | PP sawtimber, HRG, 40-60% cr.cl.                        |
| P3G         | PP sawtimber, HRG, 40% cr. cl.                          |
| P3P         | PP small sawtimber, HRG, less than 39% cr. cl.          |
| P6G         | PP two-storied, HFR                                     |
| SV          | Serviceberry                                            |
| SN          | Snowberry                                               |

|     |                                                       |
|-----|-------------------------------------------------------|
| NW  | Water                                                 |
| GH  | Weeds-annual grasses                                  |
| WW  | Wet Meadows                                           |
| W4G | WF large sawtimber, HRG, 40%+ cr. cl.                 |
| W3G | WF small sawtimber, HRG, 40%+ cr. cl.                 |
| W6G | WF two-storied, HFR                                   |
| W4P | White-fir large sawtimber, HRG, less than 39% cr.cl.  |
| W3P | White-fir small sawtimber, HRG, less than 39% cr. cl. |

## ALPHABETIC LISTING OF PLANT COMMUNITIES

|    |          |                                           |
|----|----------|-------------------------------------------|
| 54 | SS-49-21 | Alpine low sage, red fescue               |
| 47 | NB       | Barraen-rocks                             |
| 40 | SD-29-12 | Big sage, bunchgrass                      |
| 39 | SD-29-13 | Big sage, Putr, bunchgrass                |
| 41 | SD-33-11 | Bitterbrush, needlegrass, sedge           |
| 50 | MD-31-11 | Bluegrass dry meadow                      |
| 34 | GB-99    | Bluegrass scabland                        |
| 46 | MD-19-11 | Dry meadow                                |
| 53 | CJ-S1-12 | Juniper, low sage, fescue                 |
| 38 | CJ-53-11 | Juniper, Putr, bunchgrass                 |
| 52 | SD-92-12 | Low sage, bluegrass, one-spike oatgrass   |
| 43 | SD-19-12 | Low sage, fescue                          |
| 42 | SD-19-13 | Low sage, fescue, squirreltail            |
| 49 | SD-92-11 | Low sage, goldenweed, bluegrass           |
| 59 | CL-H1-11 | LPP, Aspen, strawberry                    |
| 11 | CL-M2-11 | LPP, bearberry                            |
| 15 | CL-S2-14 | LPP, bitterbrush, fescue                  |
| 18 | CL-S2-11 | LPP, bitterbrush, needlegrass             |
| 17 | CL-S2-12 | LPP, bitterbrush, sedge                   |
| 12 | CL-M3-11 | LPP, blueberry wetland                    |
| 19 | CL-S2-15 | LPP, currant, Putr, needlegrass           |
| 08 | CL-F1-11 | LPP, forb                                 |
| 24 | CL-S4-12 | LPP, grouse huckleberry                   |
| 23 | CL-S3-11 | LPP, manzanita                            |
| 16 | CL-G3-11 | LPP, needlegrass basins                   |
| 21 | CL-G3-14 | LPP, needlegrass, lupine                  |
| 22 | CL-G3-13 | LPP, needlegrass, lupine, linanthostrum   |
| 33 | CL-S2-13 | LPP, Putr, forb                           |
| 13 | CL-M1-11 | LPP, sedge, grass wetland                 |
| 20 | CL-G4-11 | LPP, sedge, lupine                        |
| 35 | CL-G4-13 | LPP, sedge, needlegrass basin             |
| 14 | CL-S9-11 | LPP, snowbrush, manzanita                 |
| 58 | CL-G4-15 | LPP, squirreltail, long stolon sedge      |
| 57 | CL-G3-15 | LPP, strawberry, fescue                   |
| 55 | CL-C1-11 | LPP, Wh Bk P, gay penstemon               |
| 56 | CL-C1-12 | LPP, Wh Bk P, WWP, sandwort               |
| 60 | CL-S1-12 | LPP, sagebrush                            |
| 45 | MM-90    | Moist meadow                              |
| 01 | CM-S1-11 | Mtn Hemlock, grouse huckleberry           |
| 03 | CR-S1-11 | Mx-con, manzanita                         |
| 06 | CW-S1-14 | Mx-con, snowbrush                         |
| 02 | CW-H1-11 | Mx-con, snowbrush, chinkapin              |
| 04 | CW-S1-12 | Mx-con, snowbrush, manzanita              |
| 05 | CW-S1-15 | Mx-con, snowbrush, sedge                  |
| 09 | CW-S1-16 | Mx-con, snowbrush, sq. carpet, strawberry |



|    |          |                                            |
|----|----------|--------------------------------------------|
| 62 | CP-H3-11 | PP, Aspen, bluegrass                       |
| 61 | CP-C2-11 | PP, Juniper, mahog, Putr, big sage, fescue |
| 63 | CP-S1-21 | PP, mtn. big sagebrush, bluegrass          |
| 36 | CP-S2-16 | PP, Putr, bunchgrass                       |
| 25 | CP-S2-11 | PP, Putr, fescue                           |
| 26 | CP-S2-17 | PP, Putr, manzanita, fescue                |
| 29 | CP-S2-13 | PP, Putr, manzanita, needlegrass           |
| 32 | CP-S2-14 | PP, Putr, manzanita, sedge                 |
| 28 | CP-S2-12 | PP, Putr, needlegrass                      |
| 37 | CP-S1-11 | PP, Putr, sagebrush, fescue                |
| 31 | CP-S2-15 | PP, Putr, sedge                            |
| 30 | CP-S3-11 | PP, Putr, snowbrush, needlegrass           |
| 07 | CP-S3-12 | PP, Putr, snowbrush, sedge                 |
| 27 | CP-F1-11 | PP, wooly wyethia                          |
| 51 | MW-19-11 | Sedge wet meadow                           |
| 48 | NW       | Water                                      |
| 44 | MW       | Wet meadow                                 |
| 64 | CW=C3-11 | WF, LPP, long stolon sedge, needlegrass    |
| 70 | CW-H2-11 | WF, PP, Aspen, long stolon sedge           |
| 68 | CW-C1-11 | WF, PP, IC, serviceberry                   |
| 66 | CW-S1-17 | WF, PP, manzanita, Ore. grape              |
| 65 | CW-S3-13 | WF, PP, snowberry, starwort                |
| 67 | CW-C4-12 | WF, PP, Sug P, manzanita                   |
| 69 | CW-C4-11 | WF, PP, WWP, sticky currant                |
| 10 | CW-S3-12 | WF, snowberry, strawberry                  |

## NUMERICAL LISTING OF PLANT COMMUNITIES

|    |          |                                           |
|----|----------|-------------------------------------------|
| 01 | CM-S1-11 | Mtn Hemlock, grouse huckleberry           |
| 02 | CW-H1-11 | Mx-con, snowbrush, chinkapin              |
| 03 | CR-S1-11 | Mx-con, manzanita                         |
| 04 | CW-S1-12 | Mx-con, snowbrush, manzanita              |
| 05 | CW-S1-15 | Mx-con, snowbrush, sedge                  |
| 06 | CW-S1-14 | Mx-con, snowbrush                         |
| 07 | CP-S3-12 | PP, Putr, snowbrush, sedge                |
| 08 | CL-F1-11 | LPP, forb                                 |
| 09 | CW-S1-16 | Mx-con, snowbrush, sq. carpet, strawberry |
| 10 | CW-S3-12 | WF, snowberry, strawberry                 |
| 11 | CL-M2-11 | LPP, bearberry                            |
| 12 | CL-M3-11 | LPP, blueberry wetland                    |
| 13 | CL-M1-11 | LPP, sedge, grass wetland                 |
| 14 | CL-S9-11 | LPP, snowbrush, manzanita                 |
| 15 | CL-S2-14 | LPP, bitterbrush, fescue                  |
| 16 | CL-G3-11 | LPP, needlegrass basins                   |
| 17 | CL-S2-12 | LPP, bitterbrush, sedge                   |
| 18 | CL-S2-11 | LPP, bitterbrush, needlegrass             |
| 19 | CL-S2-15 | LPP, currant, Putr, needlegrass           |
| 20 | CL-G4-11 | LPP, sedge, lupine                        |
| 21 | CL-G3-14 | LPP, needlegrass, lupine                  |
| 22 | CL-G3-13 | LPP, needlegrass, lupine, linanthostrum   |
| 23 | CL-S3-11 | LPP, manzanita                            |
| 24 | CL-S4-12 | LPP, grouse huckleberry                   |
| 25 | CP-S2-11 | PP, Putr, fescue                          |
| 26 | CP-S2-17 | PP, Putr, manzanita, fescue               |
| 27 | CP-F1-11 | PP, wooly wyethia                         |
| 28 | CP-S2-12 | PP, Putr, needlegrass                     |
| 29 | CP-S2-13 | PP, Putr, manzanita, needlegrass          |
| 30 | CP-S3-11 | PP, Putr, snowbrush, needlegrass          |
| 31 | CP-S2-15 | PP, Putr, sedge                           |
| 32 | CP-S2-14 | PP, Putr, manzanita, sedge                |
| 33 | CL-S2-13 | LPP, Putr, forb                           |
| 34 | GB-99    | Bluegrass scabland                        |
| 35 | CL-G4-13 | LPP, sedge, needlegrass basin             |
| 36 | CP-S2-16 | PP, Putr, bunchgrass                      |
| 37 | CP-S1-11 | PP, Putr, sagebrush, fescue               |
| 38 | CJ-53-11 | Juniper, Putr, bunchgrass                 |
| 39 | SD-29-13 | Big sage, Putr, bunchgrass                |
| 40 | SD-29-12 | Big sage, bunchgrass                      |
| 41 | SD-33-11 | Bitterbrush, needlegrass, sedge           |
| 42 | SD-19-13 | Low sage, fescue, squirreltail            |
| 43 | SD-19-12 | Low sage, fescue                          |
| 44 | MW       | Wet meadow                                |
| 45 | MM-90    | Moist meadow                              |
| 46 | MD-19-11 | Dry meadow                                |
| 47 | NB       | Barraen-rocks                             |
| 48 | NW       | Water                                     |
| 49 | SD-92-11 | Low sage, goldenweed, bluegrass           |

|    |          |                                            |
|----|----------|--------------------------------------------|
| 50 | MD-31-11 | Bluegrass dry meadow                       |
| 51 | MW-19-11 | Sedge wet meadow                           |
| 52 | SD-92-12 | Low sage, bluegrass, one-spike oatgrass    |
| 53 | CJ-S1-12 | Juniper, low sage, fescue                  |
| 54 | SS-49-21 | Alpine low sage, red fescue                |
| 55 | CL-C1-11 | LPP, Wh Bk P, gay penstemon                |
| 56 | CL-C1-12 | LPP, Wh Bk P, WWP, sandwort                |
| 57 | CL-G3-15 | LPP, strawberry, fescue                    |
| 58 | CL-G4-15 | LPP, squirreltail, long stolon sedge       |
| 59 | CL-H1-11 | LPP, Aspen, strawberry                     |
| 60 | CL-S1-12 | LPP, sagebrush                             |
| 61 | CP-C2-11 | PP, Juniper, mahog, Putr, big sage, fescue |
| 62 | CP-H3-11 | PP, Aspen, bluegrass                       |
| 63 | CP-S1-21 | PP, mtn. big sagebrush, bluegrass          |
| 64 | CW=C3-11 | WF, LPP, long stolon sedge, needlegrass    |
| 65 | CW-S3-13 | WF, PP, snowberry, starwort                |
| 66 | CW-S1-17 | WF, PP, manzanita, Ore. grape              |
| 67 | CW-C4-12 | WF, PP, Sug P, manzanita                   |
| 68 | CW-C1-11 | WF, PP, IC, serviceberry                   |
| 69 | CW-C4-11 | WF, PP, WWP, sticky currant                |
| 70 | CW-H2-11 | WF, PP, Aspen, long stolon sedge           |